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LAKE MICHIGAN WATER QUALITY REPORT

1978

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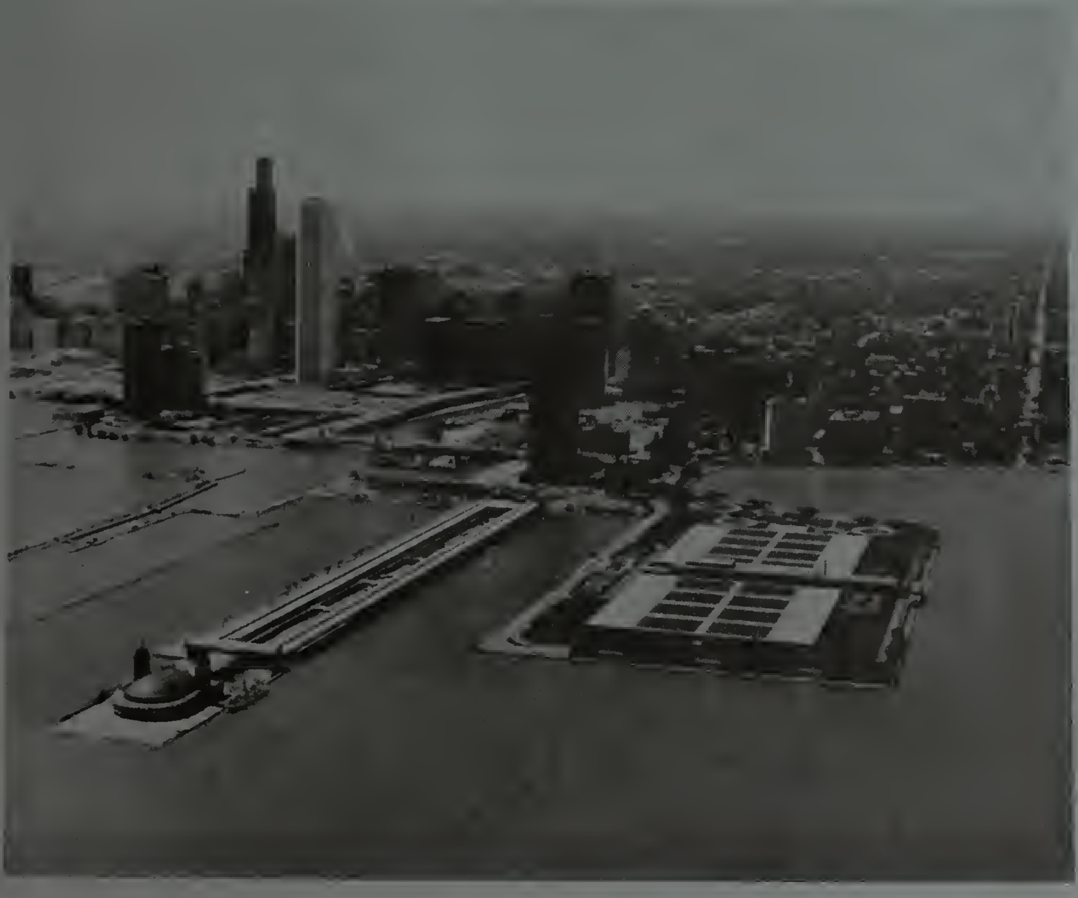


Cover: Chicago's James W. Jardine Water Purification Plant

LAKE MICHIGAN

WATER QUALITY REPORT
January through December 1978

by

THE CITY OF CHICAGO
DEPARTMENT OF WATER AND SEWERS
BUREAU OF WATER OPERATIONS
DIVISION OF WATER PURIFICATION
WATER QUALITY SURVEILLANCE SECTION

and

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL

JULY, 1979

ACKNOWLEDGEMENTS

This report was prepared under the terms of a cooperative agreement with the Illinois Environmental Protection Agency and the City of Chicago. The City of Chicago, Department of Water and Sewers, Water Purification Division's Water Quality Surveillance Section provided the data, text, and graphics for Water Quality Evaluation Summary and Sections A and B of this report. Sample analysis was performed by the Water Purification Division's Laboratory Section.

TABLE OF CONTENTS

Page

List of Figures.. iv
List of Tables... v

Water Quality Evaluation Summary, 1978................... 1

Water Quality Evaluation Summary Table................... 3

Introduction... 4

Section A Lake Michigan Water Quality.................... 6
(1) Open Water Survey.................................... 6
Discussion... 8
Summary Table.. 9
(2) North Shore Lake Survey.............................. 10
Discussion... 12
Summary Table.. 14
(3) South Shore Lake Survey.............................. 15
Discussion... 17
Summary Table.. 19
(4) Jardine Water Purification Plant Radial Survey....... 20
Discussion... 22
Summary Table.. 23
(5) South Water Filtration Plant Radial Survey........... 25
Discussion... 27
Summary Table.. 28
(6) Phytoplankton Monthly Variation, 1978................ 30

Section B Ten-Year Trend Analysis........................ 33

Section C Illinois Dischargers and Pollutional Sources... 41

Appendix A: Individual Survey Data Sheets................ 48
(1) Open Water Survey.................................... 49
(2) North Shore Lake Survey.............................. 54
(3) South Shore Lake Survey.............................. 62
(4) Jardine Water Purification Plant Radial Survey (JWPP). 69
(5) South Water Filtration Plant Radial Survey (SWFP)..... 73

Appendix B: Glossary of Terms............................ 78

List of Figures

Figure Page

1 City of Chicago Lake Survey Stations........................... 5

2 Open Water Survey Stations..................................... 7

3 North Shore Lake Survey Stations............................... 11

4 South Shore Lake Survey Stations............................... 16

5 Jardine Water Purification Plant (JWPP) Radial Survey Stations.. 21

6 South Water Filtration Plant (SWFP) Radial Survey Stations...... 26

7 Phytoplankton - Monthly Variation at JWPP....................... 32

8 Ten Year Total Coliform Trend................................... 36

9 Ten Year Fecal Coliform Trend................................... 37

10 Ten Year Total Phosphate Trend................................. 38

11 Ten Year Ammonia Nitrogen Trend................................ 39

12 Ten Year Phytoplankton Trend.................................... 40

List of Tables

Table Page

1 Water Quality Evaluation Summary.................................. 3

2 Open Water Lake Survey Summary.................................... 9

3 North Shore Lake Survey Summary................................... 14

4 South Shore Lake Survey Summary................................... 19

5 JWPP Radial Lake Survey Summary................................... 23

6 SWFP Radial Lake Survey Summary................................... 28

7 Water quality data for March 21, 1978
Open Water Survey... 49

8 Water quality data for June 15, 1978
Open Water Survey... 50

9 Water quality data for August 15, 1978
Open Water Survey... 51

10 Water quality data for October 12, 1978
Open Water Survey... 52

11 Water quality data for December 5, 1978
Open Water Survey... 53

12 Water quality data for April 4, 1978
North Shore Lake Survey... 54

13 Water quality data for May 9, 1978
North Shore Lake Survey... 55

14 Water quality data for June 27, 1978
North Shore Lake Survey... 56

15 Water quality data for July 25, 1978
North Shore Lake Survey... 57

16 Water quality data for August 8, 1978
North Shore Lake Survey... 58

17 Water quality data for September 6, 1978
North Shore Lake Survey... 59

18 Water quality data for October 19, 1978
North Shore Lake Survey... 60

Table Page

19 Water quality data for November 14, 1978
North Shore Lake Survey.. 61

20 Water quality data for April 11, 1978
South Shore Lake Survey.. 62

21 Water quality data for May 25, 1978
South Shore Lake Survey.. 63

22 Water quality data for July 11, 1978
South Shore Lake Survey.. 64

23 Water quality data for August 1, 1978
South Shore Lake Survey.. 65

24 Water quality data for August 22, 1978
South Shore Lake Survey.. 66

25 Water quality data for September 12, 1978
South Shore Lake Survey.. 67

26 Water quality data for November 2, 1978
South Shore Lake Survey.. 68

27 Water quality data for December 14, 1978
South Shore Lake Survey.. 69

28 Water quality data for March 28, 1978
JWPP (Jardine Water Purification Plant) Radial Lake Survey...... 70

29 Water quality data for May 18, 1978
JWPP Radial Lake Survey.. 71

30 Water quality data for July 6, 1978
JWPP Radial Lake Survey.. 72

31 Water quality data for August 29, 1978
JWPP Radial Lake Survey.. 73

32 Water quality data for April 27, 1978
SWFP (South Water Filtration Plant) Radial Lake Survey.......... 74

33 Water quality data for May 31, 1978
SWFP Radial Lake Survey.. 75

34 Water quality data for July 18, 1978
SWFP Radial Lake Survey.. 76

35 Water quality data for October 3, 1978
SWFP Radial Lake Survey.. 77

WATER QUALITY EVALUATION SUMMARY, 1978

The results of data obtained from the Lake Michigan Lake Survey Program during 1978 are presented in this annual report. The major points regarding water quality in southwestern Lake Michigan during 1978 are presented in the following summary.

Water quality continues to be very good based on measured bacterial levels with the exception of near-shore locations in the Calumet-Indiana Harbor area. Total and fecal coliform organisms are present in significantly lower numbers along the north shore than along the south shore (Figures 8 & 9). Average fecal coliform levels at all sample stations are below the water quality standard limit of 20 organisms/100 ml as a geometric mean. A decreasing pattern in total coliform levels along the north shore is evident over the past 10 years (Figure 8).

A decline in total phosphate levels at all sample stations was apparent during 1978 with average concentrations approaching 0.021 mg/l of phosphate (equivalent to the water quality standard for phosphorus (as P) of 0.007 mg/l). This decrease was observed for the first time in the last 10 years (Figure 10). Continuing surveillance will determine if the decrease is permanent or temporary.

Ammonia nitrogen levels have been decreasing over the past ten years in southwestern Lake Michigan and data collected during 1978 support this trend. Average levels along the south shore remain higher than those along the north shore which have dropped below the standard limit of 0.02 mg/l. Maximum ammonia nitrogen levels continue to occur off the Indiana Harbor Canal (Figure 11).

A significant drop in total phytoplankton has taken place over the past decade in southwestern Lake Michigan, the result of decreasing diatom populations. Concentrations observed during 1978 maintain this declining pattern (Figure 12).

A summary of water quality data obtained from the Lake Michigan Survey Program is presented in a Summary Table (Table I). The bacterial and chemical data collected during 1978 when compared to the previous 10 years indicate that a gradual improvement in water quality is occurring in southwestern Lake Michigan.

TABLE 1
CITY OF CHICAGO
WATER PURIFICATION DIVISION, WATER QUALITY SURVEILLANCE SECTION
SOUTHWESTERN LAKE MICHIGAN
WATER QUALITY EVALUATION
1978

PARAMETER	STANDARD	NEARSHORE less than 3mi. from shore		OFFSHORE more than 3mi. from shore		ALL STATIONS	
		AVERAGE	NO.	AVERAGE	NO.	AVERAGE	NO.
TURBIDITY F.T.U.		1.43	223	0.58	191	1.04	414
ODOR, THRESHOLD T.O.N.		1.4	223	1.2	191	1.3	414
CONDUCTIVITY µmhos		296.5	223	291.9	191	294.4	414
OXYGEN DEMAND, CHEMICAL mg/l		10.2	223	9.5	191	9.9	414
pH	7.0-9.0	8.40	223	8.41	191	8.40	414
RESIDUE, TOTAL NONFILTRABLE mg/l	180	6.61	223	4.90	191	5.82	414
RESIDUE, FILTRABLE mg/l				168.0	67	168.0	67
NITROGEN, ORGANIC mg/l		0.13	223	0.12	191	0.12	414
NITROGEN, AMMONIA mg/l	0.02	0.021	223	0.013	191	0.017	414
NITROGEN, NITRITE-NITRATE mg/l	11.0	0.244	215	0.230	188	0.237	403
PHOSPHATE, TOTAL mg/l	0.021	0.025	223	0.022	191	0.024	414
PHOSPHATE, DISSOLVED mg/l		0.012	223	0.012	191	0.012	414
SODIUM mg/l				4.6	67	4.6	67
POTASSIUM mg/l				0.99	67	0.99	67
CHLORIDE mg/l	12.0	9.98	223	9.76	191	9.88	414
SULFATE mg/l	24.0	22.8	223	22.1	191	22.5	414
SILICA, SiO_2 mg/l				0.51	67	0.51	67
IRON µg/l	1000	33.0	104	15.5	76	25.6	180
PHENOLS µg/l	100	<1	223	<1	125	<1	348
ASBESTOS fibers/l X 1000				287.8	4	287.8	4
PLATE COUNT, 48 HR.- 35° C /ml		1127	223	175	191	688	414
COLIFORM, TOTAL /100 ml		209	223	60	191	140	414
COLIFORM, FECAL /100 ml geo. mean	20	0.36	223	0.06	191	0.15	414
STREP, FECAL /100 ml		0.31	202	0.03	128	0.20	330
FUNGI /ml		0.48	223	0.22	191	0.36	414
ACTINOMYCETES /ml		1.38	222	0.49	191	0.97	413
PLANKTON /ml		728	179	310	179	519	358

INTRODUCTION

Lake Michigan serves a broad spectrum of purposes. It is the source of drinking water for 5 million residents of northeastern Illinois. Its recreational opportunities attract fishing, boating, swimming and other water-oriented interests. It is the avenue for domestic and international waterborne commerce. Its readily available water for industry and commerce encouraged the growth and development of the greater Chicago metropolitan area into one of the largest industrial-commercial complexes in the United States. Ironically, Lake Michigan has also been the recipient of municipal and industrial wastes.

Recognizing the importance of Lake Michigan as a natural asset, the 75th Illinois General Assembly authorized the Illinois Environmental Protection Agency to ".... regularly conduct water quality and lake bed surveys to evaluate the ecology and the quality of water in Lake Michigan." Monitoring programs have provided information on the condition of the Illinois waters of Lake Michigan. As data are gathered on a continuing basis, it should be possible to determine long-term trends in lake water quality. Location of sampling sites for the lake survey program are shown in Figure 1. Lake water quality at the survey sites has been evaluated on the basis of the water quality standards promulgated by the Illinois Pollution Control Board.

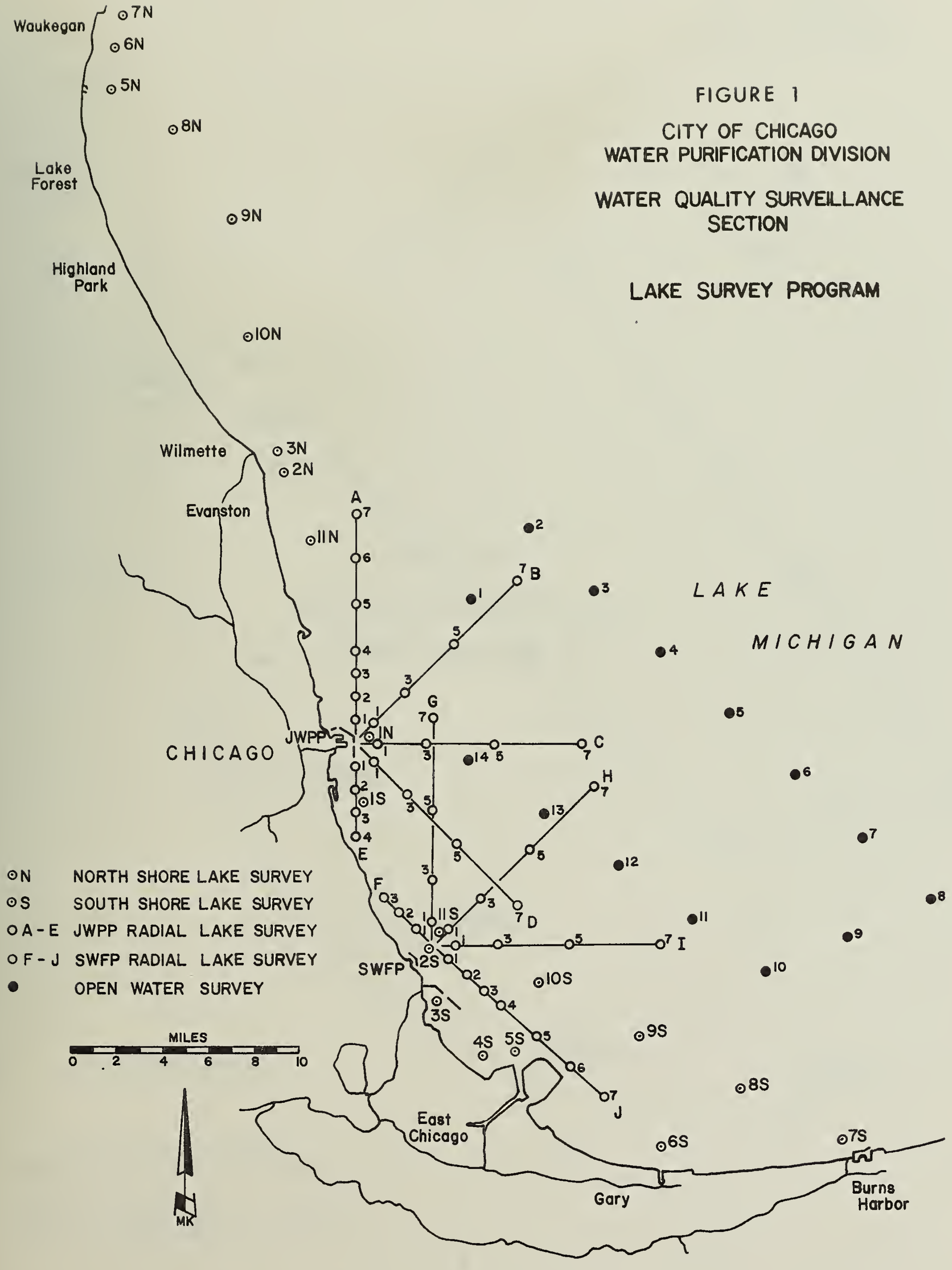


FIGURE 1

CITY OF CHICAGO
WATER PURIFICATION DIVISION

WATER QUALITY SURVEILLANCE
SECTION

LAKE SURVEY PROGRAM

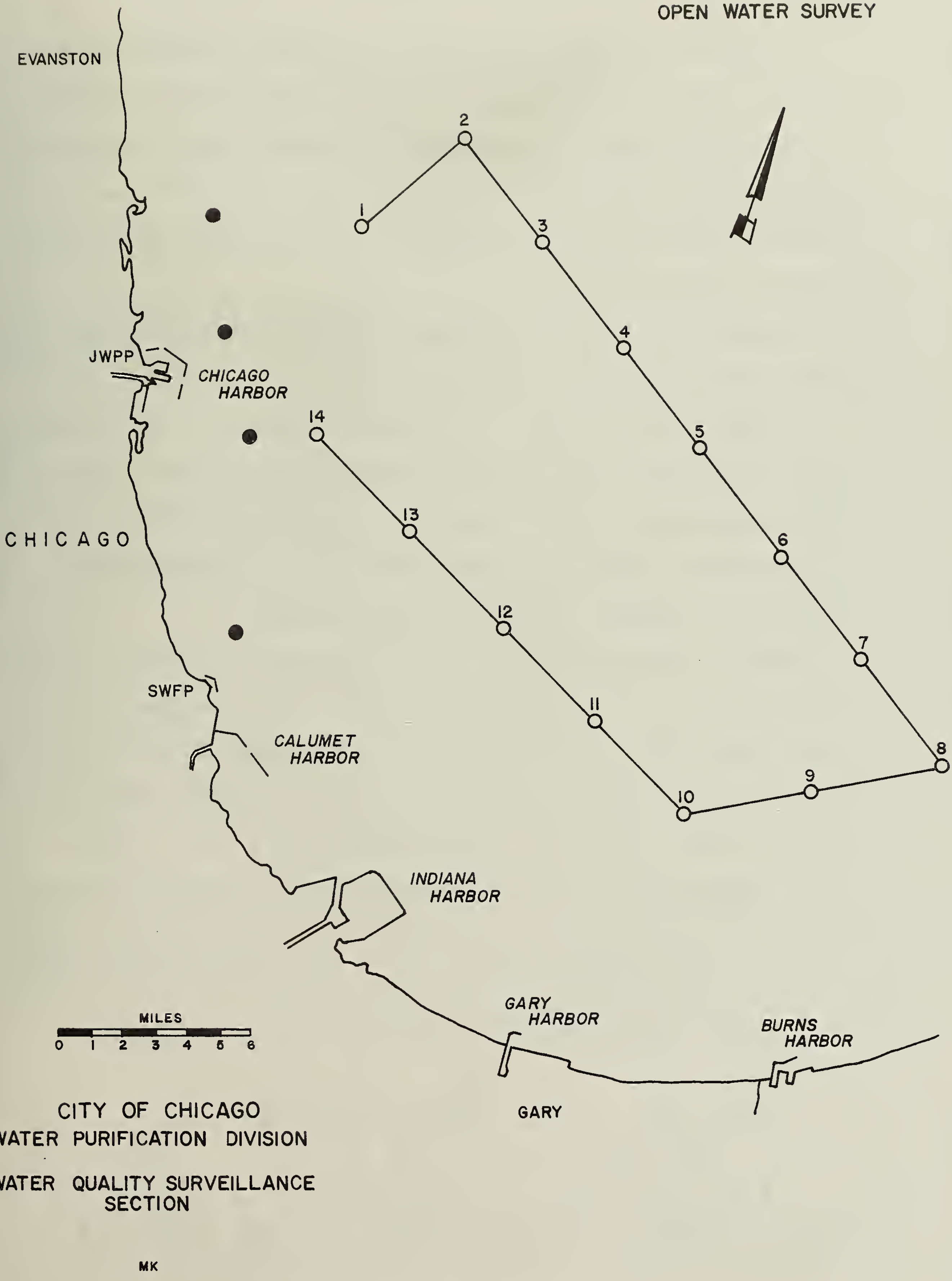
Section A

Lake Michigan Water Quality

1. OPEN WATER SURVEY

FIGURE 2

LAKE MICHIGAN
OPEN WATER SURVEY



OPEN WATER SURVEY

The Open Water Survey consists of 14 sample points located from 6 to 17 miles offshore between Evanston, Illinois and Burns Harbor, Indiana. This survey is intended to assess open water quality away from the direct influence of shore discharges. The data is used to detect and monitor long-term changes occurring in Lake Michigan and as a reference to data obtained in nearshore areas.

A summary of all chemical and microbiological analyses performed during 1978 is presented in Table 2.

The water quality of open water areas of southwestern Lake Michigan based on measured bacterial levels was excellent during 1978. Plate count averages at all points ranged from 4 to 13 per ml. Total coliform averages ranged between 1 and 9 per 100 ml. Fecal coliform and fecal streptococcus averages were 0 at all sample points.

Ammonia nitrogen levels at all points averaged 0.01 mg/l, well below the water quality standard limit of 0.02 mg/l. Total phosphate levels ranged from 0.013 to 0.028 mg/l compared to the standard limit of 0.021 mg/l. All chloride average levels were below the standard limit of 12.0 mg/l except for point 1 which had an average of 12.2 mg/l. Sulfate levels ranged from 21.6 to 22.6 mg/l compared to the standard limit of 24.0.

TABLE 2

1978

OPEN WATER LAKE SURVEY SUMMARY TABLE

PARAMETER		STORET NUMBER	SURVEYS	ANNUAL MEAN 1	2	3	4	5	6	7	8	9	10	11	12	13	14
TURBIDITY	F.T.U.	00076	5	0.38	0.36	0.33	0.33	0.33	0.33	0.36	0.38	0.38	0.38	0.37	0.35	0.35	0.41
ODOR, THRESHOLD	T.O.N.	00086	5	1.8	1.0	1.4	1.2	1.0	1.0	1.0	1.5	1.5	1.3	1.2	1.0	1.0	1.0
CONDUCTIVITY	µmhos	00095	5	289	289	289	289	287	290	290	290	293	291	292	290	286	286
OXYGEN DEMAND, CHEMICAL	mg/l	00035	5	11.3	10.3	919	14.3	10.2	10.9	8.5	6.6	5.9	5.2	10.3	8.7	8.9	12.3
pH		00400	5	8.3	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
RESIDUE, TOTAL NONFILTRABLE	mg/l	00530	5	4.0	6.8	6.0	4.2	3.4	2.0	2.4	2.8	4.0	3.0	3.8	4.0	4.2	4.4
RESIDUE, FILTRABLE	mg/l	00515	5	168	167	166	165	166	168	172	172	168	170	168	170	165	168
NITROGEN, ORGANIC	mg/l	00605	5	0.12	0.11	0.11	0.13	0.12	0.12	0.12	0.11	0.12	0.13	0.11	0.13	0.12	0.13
NITROGEN, AMMONIA	mg/l	00610	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE - NITRATE	mg/l	00630	5	0.22	0.23	0.22	0.22	0.22	0.21	0.23	0.25	0.24	0.24	0.24	0.24	0.23	0.22
PHOSPHATE, TOTAL	mg/l	00650	5	0.024	0.022	0.020	0.020	0.016	0.014	0.022	0.015	0.015	0.013	0.020	0.018	0.020	0.028
PHOSPHATE, DISSOLVED	mg/l	00653	5	0.014	0.012	0.012	0.012	0.010	0.010	0.012	0.010	0.010	0.010	0.010	0.010	0.010	0.012
SODIUM	mg/l	00929	5	4.7	4.7	4.7	4.7	4.6	4.7	4.7	4.7	4.6	4.6	4.8	4.5	4.5	4.6
POTASSIUM	mg/l	00937	5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CHLORIDE	mg/l	00940	5	12.2	9.6	9.6	9.5	9.4	9.4	9.8	9.4	9.6	9.5	10.1	10.0	9.7	10.0
SULPHATE	mg/l	00945	5	21.8	21.6	21.7	21.7	21.8	21.6	21.9	21.6	22.3	22.1	22.6	21.9	22.2	22.3
SILICA, SiO_2	mg/l	00956	5	0.48	0.62	0.58	0.54	0.54	0.52	0.50	0.38	0.38	0.38	0.48	0.52	0.56	0.54
ASBESTOS	fibers/l X 1000	00940	1		629		330		106		86.3						
PLATE COUNT, 48 HR. - 35°C	/ml	31753	5	10	8	8	4	7	8	6	13	11	9	13	7	6	12
COLIFORM, TOTAL	/100 ml	31503	5	9	2	2	0	3	1	1	0	1	0	0	1	0	0
COLIFORM, FECAL	/100 ml	31616	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STREP, FECAL	/100 ml	31679	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FUNGI	/ml	31856	5	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.2	0.4	0.0
ACTINOMYCETES	/ml	80148	5	0.6	0.0	0.2	0.2	0.0	0.2	0.0	0.8	0.3	0.5	1.0	0.2	0.0	0.0
PLANKTON	/ml	60050	5	240	76	112	44	52	52	60	55	325	200	120	88	460	176

City of Chicago Water Purification Division Water Quality Surveillance Section

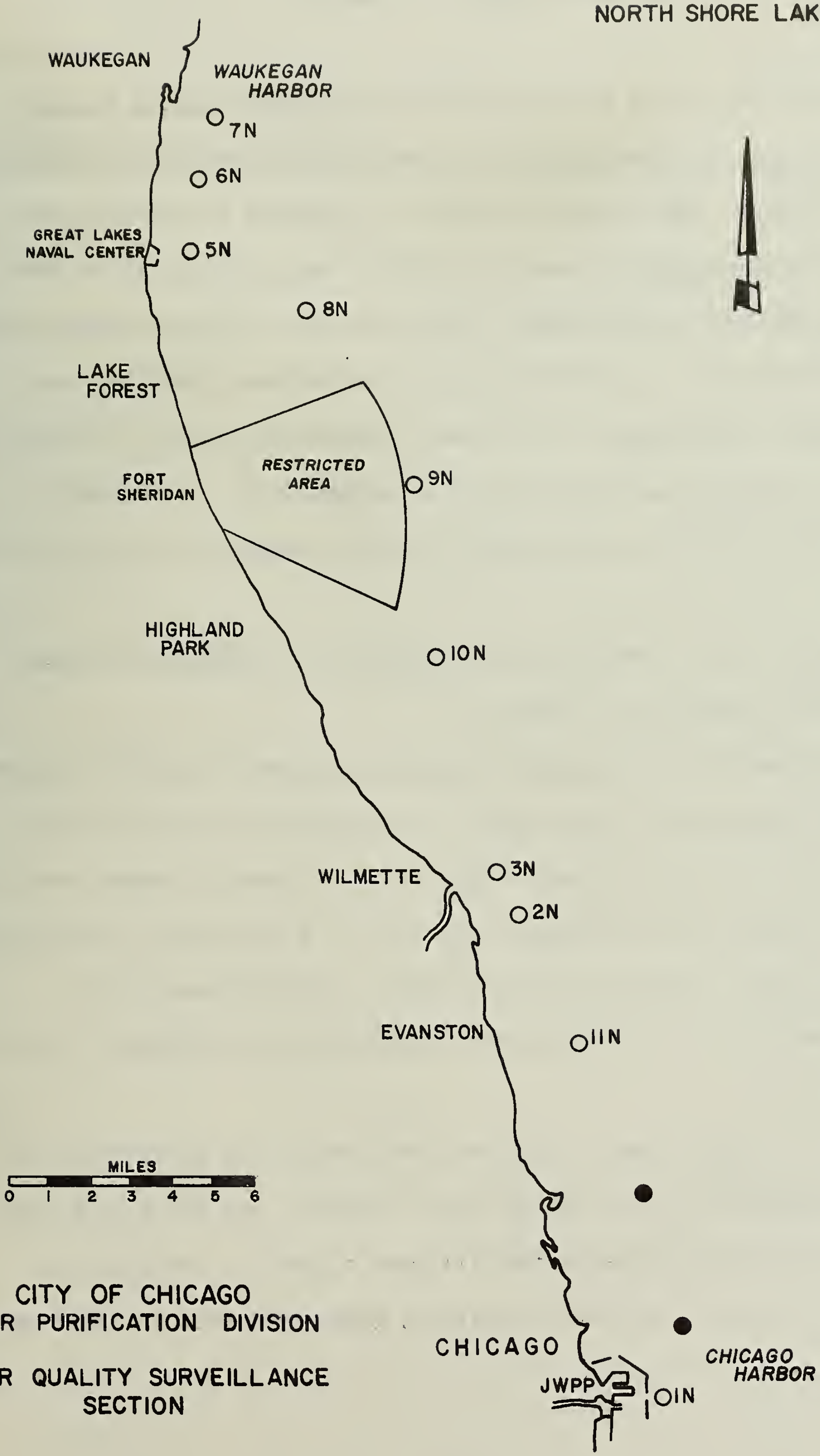
Section A (Continued)

Lake Michigan Water Quality

2. NORTH SHORE LAKE SURVEY

FIGURE 3

LAKE MICHIGAN
NORTH SHORE LAKE SURVEY



CITY OF CHICAGO
WATER PURIFICATION DIVISION

WATER QUALITY SURVEILLANCE
SECTION

MK

NORTH SHORE LAKE SURVEY

The North Shore Lake Survey consists of 10 sample points located between the City of Chicago Jardine Water Purification Plant and Waukegan Harbor, Illinois. The 10 sample points are numbered 1N through 11N (point 4N has been dropped) and are located from 1 to 4 miles offshore.

During the past several years, sewage treatment plant effluents along the north shore have been eliminated or diverted away from the lake. The last effluent at Waukegan, Illinois was diverted during 1978. Remaining discharges along the north shore consist primarily of cooling water. Other factors affecting water quality include creeks and boat harbors in the area.

A summary of all chemical and microbiological analyses performed during 1978 is presented in Table 3.

Offshore water quality based on measured bacterial levels along the north shore continues to be very good. Average total coliform levels ranged from 4 to 11 per 100 ml. Fecal coliform geometric means were 0 at all points except 1N and 3N which had means of 2 per 100 ml, well below the Lake Michigan standard of 20 per 100 ml. Fecal streptococcus averages were 0 at all points except 1N which had an average of 1 per 100 ml.

Ammonia nitrogen levels along the north shore were below the water quality standard limit of 0.02 mg/l at all points, and the significant decrease which has occurred during the past 5 years is probably the result of elimination of sewage treatment plant effluents in the area.

Total phosphate levels have decreased considerably during 1978 and sample point averages ranged from 0.018 to 0.026 mg/l compared to the standard limit of 0.021 mg/l.

Chloride levels ranged from 9.2 to 9.8 mg/l, well below the standard limit of 12 mg/l.

Sulfate levels ranged from 21.4 to 22.8 mg/l compared to the standard limit of 24.0 mg/l.

TABLE 3

1978

NORTH SHORE LAKE SURVEY SUMMARY TABLE

PARAMETER		STORET NUMBER	SURVEYS	ANNUAL MEAN									
				1N	2N	3N	5N	6N	7N	8N	9N	10N	11N
TURBIDITY	F.T.U.	00076	8	2.58	1.68	1.31	1.02	1.39	1.74	0.68	0.53	0.72	1.56
ODOR, THRESHOLD	T.O.N.	00086	8	2.5	1.8	1.4	1.6	1.5	1.1	1.4	1.3	1.1	1.1
CONDUCTIVITY	µmhos	00095	8	286	291	295	290	291	293	288	288	289	291
OXYGEN DEMAND, CHEMICAL	mg/l	00335	8	10.9	10.2	9.8	9.1	8.5	8.7	8.5	8.1	8.8	11.1
pH		00400	8	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
RESIDUE, TOTAL NONFILTRABLE	mg/l	00530	8	6.4	4.8	6.4	3.9	3.1	4.3	4.6	5.1	2.8	4.0
NITROGEN, ORGANIC	mg/l	00605	8	0.12	0.13	0.14	0.15	0.13	0.15	0.16	0.16	0.12	0.14
NITROGEN, AMMONIA	mg/l	00610	8	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE	mg/l	00630	8	0.25	0.24	0.23	0.23	0.23	0.24	0.22	0.22	0.22	0.24
PHOSPHATE, TOTAL	mg/l	00650	8	0.026	0.023	0.020	0.023	0.023	0.024	0.018	0.018	0.024	0.023
PHOSPHATE, DISSOLVED	mg/l	00653	8	0.013	0.013	0.013	0.015	0.013	0.013	0.013	0.011	0.011	0.014
CHLORIDE	mg/l	00940	8	9.8	9.6	9.5	9.7	9.5	9.6	9.2	9.3	9.3	9.6
SULFATE	mg/l	00945	8	21.9	22.8	21.5	21.6	22.0	21.7	22.1	21.4	21.9	22.3
PHENOLS	µg/l	32730	8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT, 48 HR. - 35°C	/ml	31753	8	163	22	19	34	27	31	11	15	19	24
COLIFORM, TOTAL	/100 ml	31503	8	11	11	14	5	5	11	5	4	5	8
COLIFORM, FECAL	/100 ml geo. mean	31616	8	1	0	1	0	0	0	0	0	0	0
STREP, FECAL	/100 ml	31679	8	1	0	0	0	0	0	0	0	0	0
FUNGI	/ml	31856	8	0.4	0.4	0.4	1.3	0.9	0.9	0.3	0.5	0.4	0.0
ACTINOMYCETES	/ml	80148	8	1.3	1.6	1.4	1.5	2.0	2.1	0.6	0.3	0.4	0.0
PLANKTON	/ml	60050	7	900	1142	1231	571	437	594	306	411	494	866

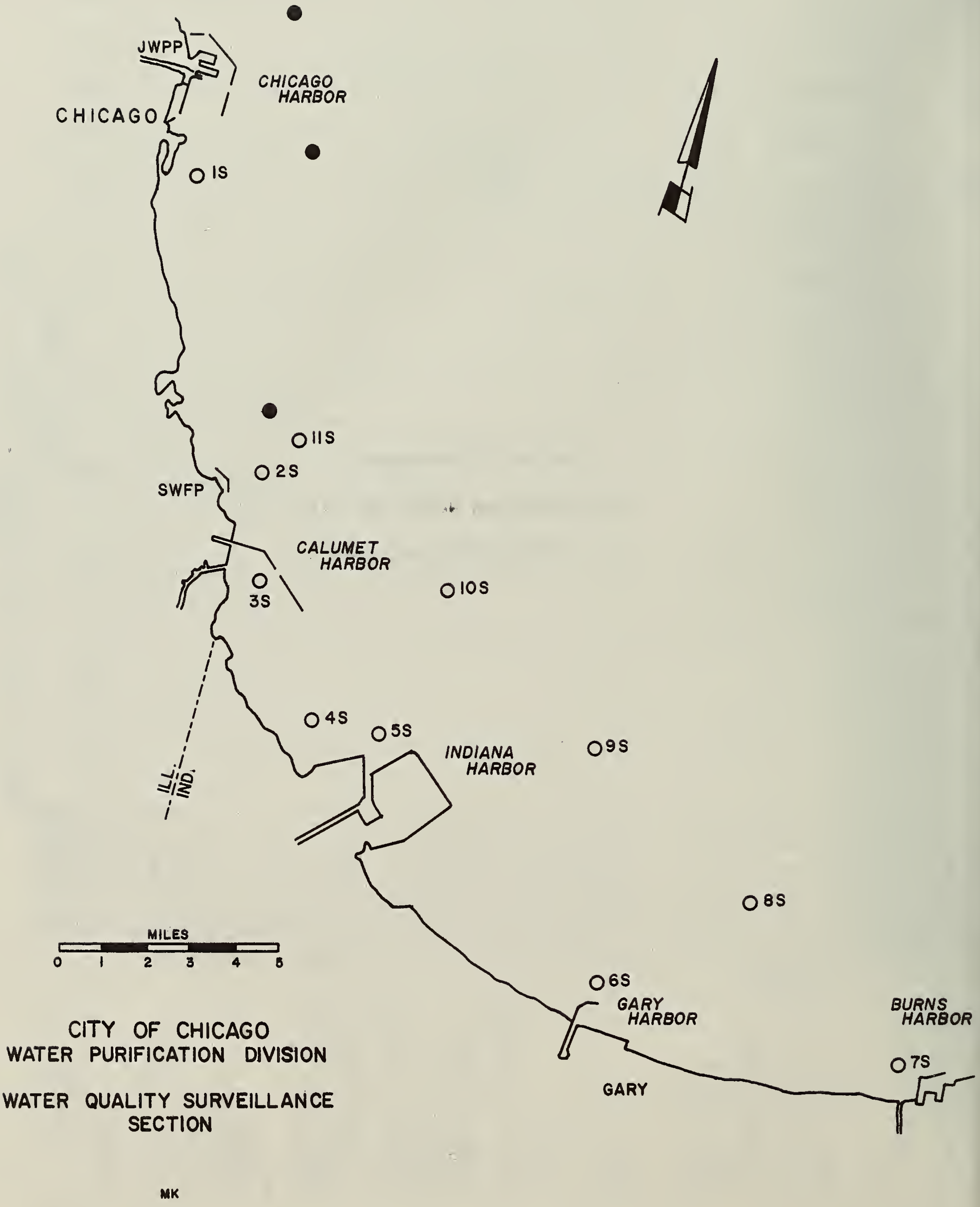
Section A (Continued)

Lake Michigan Water Quality

3. SOUTH SHORE LAKE SURVEY

FIGURE 4

LAKE MICHIGAN
SOUTH SHORE LAKE SURVEY



SOUTH SHORE LAKE SURVEY

The South Shore Lake Survey consists of 11 points numbered 1S through 11S between Chicago's Burnham Park Harbor and Burns Harbor, Indiana, just east of Gary. Points 1S through 7S are within one mile of shore and are strongly influenced by shore discharges. Points 8S through 11S are from two to six miles offshore and measure the indirect effects of these discharges on the lake proper.

The shore in the vicinity of this survey consists of one of the most concentrated industrial areas in the nation with a predominance of petroleum and steel manufacturing complexes. The area is drained by three primary streams, all of which connect directly with the lake. These are the Indiana Harbor Canal, the Calumet River and Burns Ditch.

The Indiana Harbor Canal is the main source of pollution in the area, carrying effluents from municipal sewage treatment plants, steel mills and oil refineries. Over 90 percent of the water in the Canal originates from sewers as treated waste water, cooling water or stormwater overflow. Water from the Canal often flows northward as a plume, causing episodes of degraded quality water at Chicago's South Water Filtration Plant and requiring additional water treatment to remove tastes and odors.

The Grand Calumet River normally flows away from the lake but may flow into the lake during heavy rains. However, flow just at the mouth of the river is usually outward due to discharges and polluted Calumet Harbor water is carried into the lake.

Burns Ditch discharges into Lake Michigan through Burns Harbor and drains the Little Calumet River, which is heavily influenced by sewer discharges.

A summary of all chemical and microbiological analyses performed during 1978 is presented in Table 4.

Bacterial pollution along the south shore continued to be quite high during 1978 at near-shore locations in the Calumet and Indiana Harbor areas. Bacterial levels at offshore stations (points 8S-11S) were largely determined by wind conditions affecting the behavior of shore discharges just prior to sample collection. Point 10S, located 4 miles north of the Indiana Harbor Canal, had a relatively high total coliform average for 1978 due to high counts obtained on August 22 and September 12. These elevated levels were due to southerly winds during the previous 24-36 hours carrying polluted Indiana Harbor Canal water into the area.

Ammonia nitrogen average levels along the south shore were in excess of the standard limit of 0.02 mg/l at four points: 3S, 4S, 5S and 10S. Point 5S off Indiana Harbor Canal had the highest average of 0.13 mg/l.

Total phosphate levels showed a considerable decrease during 1978 and averages ranged from 0.013 to 0.038 mg/l compared to the standard limit of 0.021 mg/l. However, 8 of the 11 sample points were in excess of the standard.

Chloride and sulfate levels were within the standard limits of 12.0 mg/l and 24.0 mg/l, respectively, except for point 5S off the Indiana Harbor Canal which had a sulfate average of 26.1 mg/l.

TABLE 4

1978
SOUTH SHORE LAKE SURVEY SUMMARY TABLE

PARAMETER	STORET NUMBER	SUR-VEYS	ANNUAL MEAN										
			1S	2S	3S	4S	5S	6S	7S	8S	9S	10S	11S
TURBIDITY F.T.U.	00076	8	1.44	1.17	1.83	1.55	1.71	1.20	1.29	0.99	1.01	1.11	1.06
ODOR, THRESHOLD T.O.N.	00086	8	1.6	1.0	1.3	1.8	1.9	1.6	1.3	1.4	1.1	1.3	1.1
CONDUCTIVITY µmhos	00095	8	291	295	301	302	314	299	303	297	295	301	294
OXYGEN DEMAND, CHEMICAL mg/l	00335	8	10.2	9.9	8.4	9.2	14.4	10.9	10.1	9.2	9.1	8.6	8.6
pH	00400	8	8.4	8.4	8.3	8.4	8.3	8.4	8.4	8.4	8.4	8.4	8.4
RESIDUE, TOTAL NONFILTRABLE mg/l	00530	8	5.1	4.9	5.6	5.3	4.1	4.0	7.1	4.3	4.1	3.4	4.8
NITROGEN, ORGANIC mg/l	00605	8	0.12	0.11	0.14	0.16	0.13	0.14	0.13	0.14	0.12	0.13	0.12
NITROGEN, AMMONIA mg/l	00610	8	0.01	0.02	0.03	0.04	0.13	0.02	0.02	0.02	0.02	0.06	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	7	0.23	0.22	0.24	0.23	0.23	0.22	0.24	0.21	0.21	0.22	0.21
PHOSPHATE, TOTAL mg/l	00650	8	0.020	0.013	0.028	0.024	0.021	0.024	0.023	0.023	0.038	0.024	0.024
PHOSPHATE, DISSOLVED mg/l	00653	8	0.011	0.010	0.010	0.010	0.013	0.011	0.010	0.013	0.024	0.011	0.010
CHLORIDE mg/l	00940	8	9.4	9.4	9.9	10.3	11.3	9.6	10.2	9.8	9.5	10.3	9.5
SULFATE mg/l	00945	8	22.1	22.2	23.7	23.8	26.1	22.8	23.9	22.8	22.6	23.8	22.0
PHENOLS µg/l	32730	8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT, 48 HR. - 35°C /ml	31753	8	53	165	4368	6949	9858	501	1472	403	153	2926	43
COLIFORM, TOTAL /100 ml	31503	8	24	49	151	3595	1306	95	89	99	63	1106	20
COLIFORM, FECAL /100 ml geo. mean	31616	8	0	2	8	17	17	4	4	2	2	3	2
STREP, FECAL /100 ml	31679	8	1	1	3	0	1	1	2	0	0	0	0
FUNGI /ml	31856	8	0.9	0.3	0.6	0.8	0.0	0.9	1.0	0.8	0.4	0.3	0.1
ACTINOMYCETES /ml	80148	8	0.5	0.6	1.0	1.5	2.9	2.0	1.3	1.4	0.3	1.4	0.0
PLANKTON /ml	60050	7	669	583	663	686	731	826	1270	607	783	717	513

City of Chicago — Water Purification Division — Water Quality Surveillance Section

Section A (Continued)

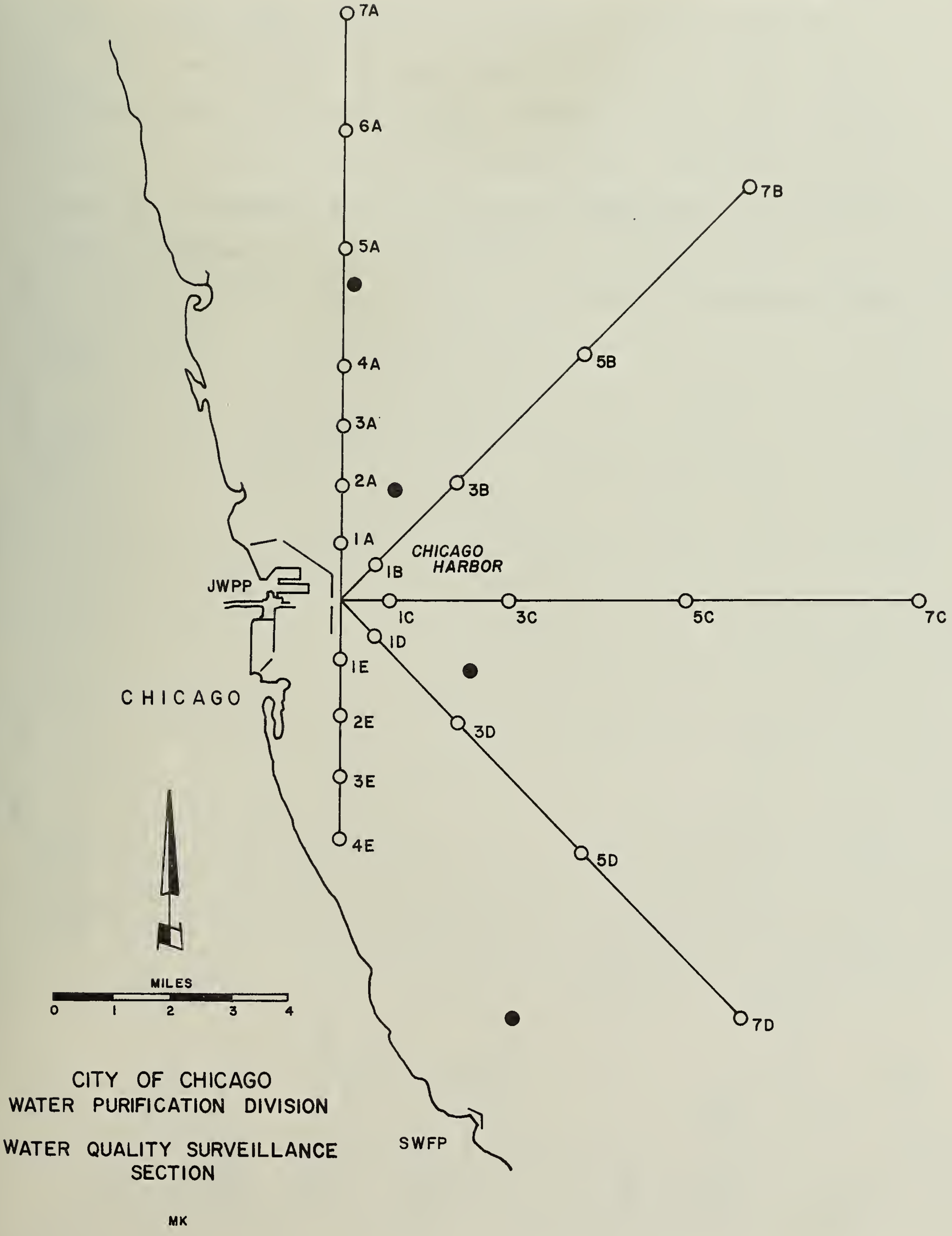
Lake Michigan Water Quality

4. JARDINE WATER PURIFICATION PLANT RADIAL SURVEY

FIGURE 5

LAKE MICHIGAN

JARDINE WATER
PURIFICATION PLANT
RADIAL SURVEY



JARDINE WATER PURIFICATION PLANT RADIAL SURVEY

The J.W.P.P. Radial Lake Survey consists of 23 sample points located along 5 radii of a circle with a point near the Jardine Plant as the center. This survey is intended to assess water quality within 10 miles of the Jardine Plant. Water quality in the vicinity of this survey is generally very good because of the lack of shore discharges in the area. A summary of all chemical and microbiological analyses performed during 1978 is presented in Table 5.

TABLE 5

1978
JWPP RADIAL LAKE SURVEY SUMMARY TABLE

PARAMETER		STORET NUMBER	SUR-VEYS	ANNUAL MEAN										
				1A	2A	3A	4A	5A	6A	7A	1B	3B	5B	7B
TURBIDITY	F.T.U.	00076	4	1.90	1.39	1.14	1.24	1.26	1.05	1.01	1.74	0.58	0.45	0.45
ODOR, THRESHOLD	T.O.N.	00086	4	1.5	1.3	1.0	1.0	1.3	1.0	1.0	1.0	1.3	1.0	1.0
CONDUCTIVITY	µmhos	00095	4	298	303	299	303	301	296	299	299	295	299	295
OXYGEN DEMAND, CHEMICAL	mg/l	00335	4	11.3	11.1	9.8	10.2	9.1	7.8	12.0	8.6	11.0	9.6	11.3
pH		00400	4	8.3	8.3	8.3	8.3	8.4	8.4	8.3	8.4	8.4	8.4	8.4
RESIDUE, TOTAL NONFILTRABLE	mg/l	00530	4	4.5	7.3	9.5	6.3	7.8	5.8	4.3	8.5	6.8	4.5	12.0
NITROGEN, ORGANIC	mg/l	00605	4	0.08	0.15	0.08	0.11	0.08	0.21	0.09	0.12	0.08	0.08	0.08
NITROGEN, AMMONIA	mg/l	00610	4	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE	mg/l	00630	4	0.26	0.25	0.25	0.27	0.28	0.26	0.24	0.25	0.27	0.26	0.24
PHOSPHATE, TOTAL	mg/l	00650	4	0.035	0.033	0.023	0.050	0.028	0.018	0.038	0.023	0.033	0.028	0.018
PHOSPHATE, DISSOLVED	mg/l	00653	4	0.015	0.018	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
CHLORIDE	mg/l	00940	4	10.3	9.9	9.8	9.7	9.7	9.6	9.7	9.9	9.7	9.7	9.6
SULFATE	mg/l	00945	4	22.3	22.9	22.3	22.3	22.0	22.1	22.4	22.3	22.3	22.5	22.5
PHENOLS	µg/l	32730	4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
IRON	µg/l	01045	4	45.5	20.0	35.3	33.0	38.0	24.5	23.5	17.5	13.3	11.5	18.0
PLATE COUNT, 48 HR. - 35°C	/ml	31753	4	18	8	12	16	15	10	7	5	4	7	5
COLIFORM, TOTAL	/100 ml	31503	4	1	1	3	1	0	0	0	1	1	4	6
COLIFORM, FECAL	/100 ml geo. mean	31616	4	0	0	0	0	0	0	0	0	0	0	0
STREP, FECAL	/100 ml	31679	3	0	0	0	0	0	0	0	0	0	0	0
FUNGI	/ml	31856	4	1.0	0	0.5	0.8	0.0	0.3	0.3	0.3	0.3	0.5	0.0
ACTINOMYCETES	/ml	80148	4	2.3	3.8	1.3	1.0	0.8	1.5	1.5	1.0	0.8	1.0	0.0
PLANKTON	/ml	60050	4	595		480		450		365	205	365	200	205

TABLE 5 (CONT.)

1978 JWPP (cont.)

PARAMETER	STORET NUMBER	SUR-VEYS	ANNUAL MEAN 1C	3C	5C	7C	1D	3D	5D	7D	1E	2E	3E	4E
TURBIDITY F.T.U.	00076	4	1.01	0.54	0.45	0.46	1.03	0.54	0.51	0.58	2.48	2.54	2.26	1.05
ODOR, THRESHOLD T.O.N.	00086	4	1.3	1.0	1.0	1.0	1.3	1.0	1.0	1.0	1.5	1.3	1.5	1.5
CONDUCTIVITY µmhos	00095	4	300	300	296	291	298	294	298	296	301	296	295	291
OXYGEN DEMAND, CHEMICAL mg/l	00335	4	10.5	11.4	11.8	8.6	10.8	10.3	9.1	12.5	11.0	9.1	9.3	9.1
pH	00400	4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
RESIDUE, TOTAL NONFILTRABLE mg/l	00530	4	11.3	8.3	7.3	6.0	12.5	6.8	4.3	4.8	9.0	9.8	9.5	5.5
NITROGEN, ORGANIC mg/l	00605	4	0.18	0.12	0.11	0.13	0.17	0.14	0.10	0.13	0.15	0.15	0.16	0.14
NITROGEN, AMMONIA mg/l	00610	4	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	4	0.24	0.26	0.23	0.24	0.23	0.25	0.26	0.25	0.25	0.28	0.28	0.28
PHOSPHATE, TOTAL mg/l	00650	4	0.020	0.043	0.018	0.025	0.028	0.020	0.020	0.018	0.020	0.028	0.020	0.020
PHOSPHATE, DISSOLVED mg/l	00653	4	0.013	0.023	0.015	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
CHLORIDE mg/l	00940	4	9.8	9.6	9.6	9.6	9.8	9.9	9.6	9.6	9.8	10.0	10.1	9.8
SULFATE mg/l	00945	4	22.9	22.9	23.2	22.6	23.3	23.0	22.7	22.4	23.7	24.5	24.6	23.8
PHENOLS µg/l	32730	4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
IRON µg/l	01045	4	26.5	11.0	10.0	14.0	26.5	11.3	12.3	14.0	67.3	55.5	46.0	27.8
PLATE COUNT, 48 HR. - 35°C /ml	31753	4	4	3	17	5	8	6	8	41	15	17	12	6
COLIFORM, TOTAL /100 ml	31503	4	0	0	10	1	4	4	9	2	1	2	1	0
COLIFORM, FECAL /100 ml geo. mean	31616	3	0	0	0	0	0	0	0	2	1	0	0	0
STREP, FECAL /100 ml	31679	4	0	0	0	0	0	0	0	0	0	0	0	0
FUNGI /ml	31856	4	0.5	0.3	0.8	0.3	0.0	0.0	1.0	0.3	0.8	0.3	0.3	0.0
ACTINOMYCETES /ml	80148	4	1.5	0.8	0.3	0.0	1.8	0.8	0.5	0.5	0.8	0.8	0.3	0.0
PLANKTON /ml	60050	4	540	250	355	205	325	360	495	225	830	200	885	40

Section A (Continued)

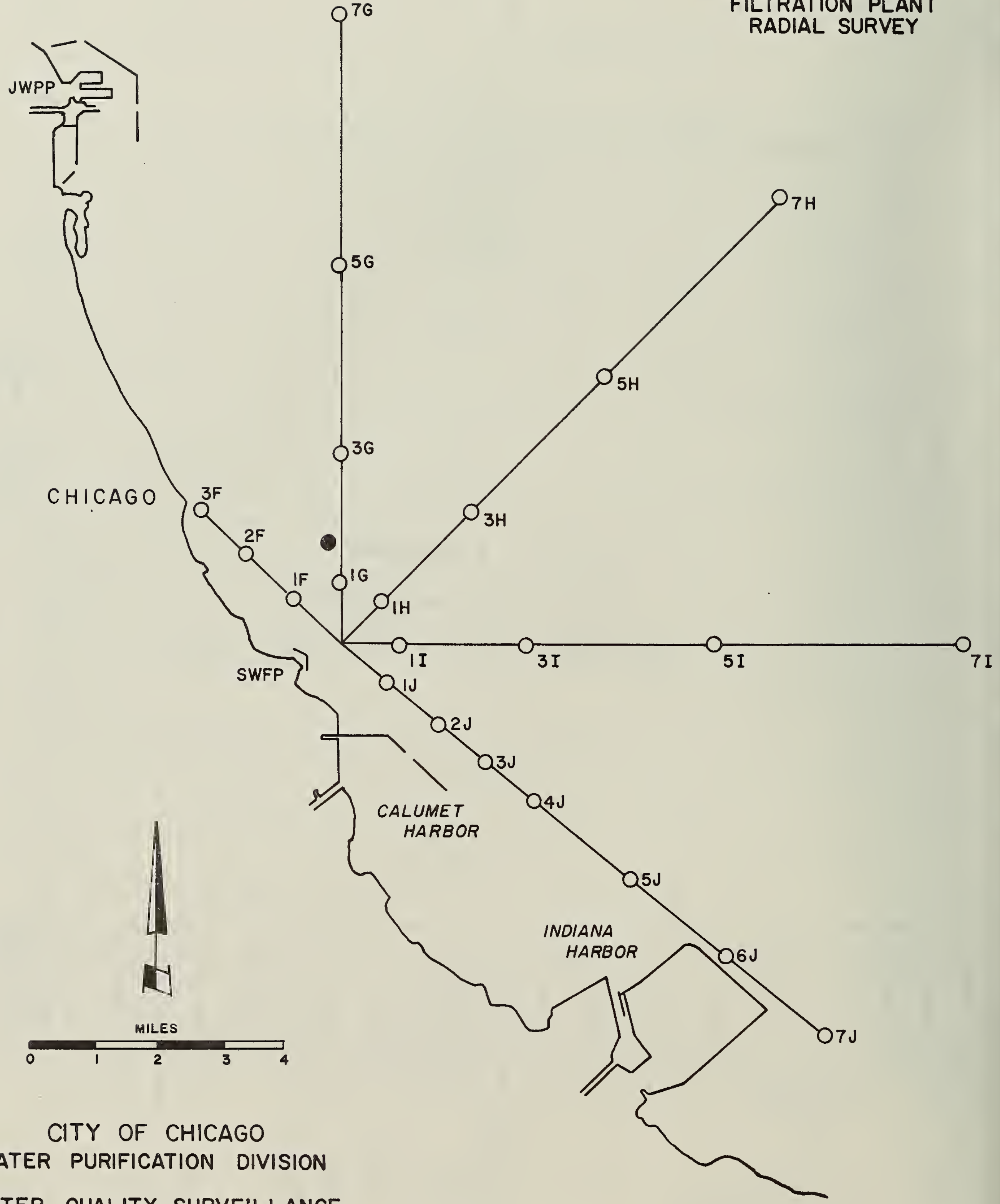
Lake Michigan Water Quality

5. SOUTH WATER FILTRATION PLANT RADIAL SURVEY

FIGURE 6

LAKE MICHIGAN

SOUTH WATER
FILTRATION PLANT
RADIAL SURVEY



CITY OF CHICAGO
WATER PURIFICATION DIVISION

WATER QUALITY SURVEILLANCE
SECTION

MK

SOUTH WATER FILTRATION PLANT RADIAL SURVEY

The S.W.F.P. Radial Lake Survey consists of 22 sampling points. These are located along five radii of a wheel using a point near Chicago's South Water Filtration Plant as the center. The survey is designed to assess the quality of the water in the vicinity of the S.W.F.P. up to a distance of 10 miles.

Water quality in the vicinity of this survey is strongly affected by the behavior of discharges in the Calumet-Indiana Harbor industrial area. Meteorological conditions determine to what extent the Indiana Harbor Canal plume and other shore discharges will be carried into the survey area. Radius "J" of the survey is most directly affected, followed by radius "I", and points along these radii usually show the highest levels of bacterial and chemical pollution.

A summary of all chemical and microbiological analyses performed during 1978 is presented in Table 6.

TABLE 6

1978

SWFP RADIAL LAKE SURVEY SUMMARY TABLE

PARAMETER	STORET NUMBER	SUR-VEYS					ANNUAL MEAN						
			1F	2F	3F	1G	3G	5G	7G	1H	3H	5H	7H
TURBIDITY F.T.U.	00076	4	1.65	0.75	1.55	1.10	0.71	0.65	0.60	1.16	0.71	0.58	0.45
ODOR, THRESHOLD T.O.N.	00086	4	1.5	1.5	1.8	1.3	1.0	2.0	1.5	1.3	1.0	1.3	1.5
CONDUCTIVITY µmhos	00095	4	295	295	294	293	291	290	285	295	293	294	290
OXYGEN DEMAND, CHEMICAL mg/l	00335	4	14.8	10.2	12.3	7.8	8.3	9.1	8.7	9.5	9.3	9.3	11.1
pH	00400	4	8.5	8.4	8.4	8.5	8.5	8.5	8.5	8.4	8.5	8.5	8.5
RESIDUE, TOTAL NONFILTRABLE mg/l	00530	4	14.0	7.3	9.3	5.6	6.0	4.8	4.5	4.8	8.0	5.8	6.0
NITROGEN, ORGANIC mg/l	00605	4	0.14	0.16	0.13	0.13	0.11	0.13	0.10	0.12	0.10	0.12	0.12
NITROGEN, AMMONIA mg/l	00610	4	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	4	0.26	0.25	0.25	0.25	0.24	0.23	0.23	0.24	0.24	0.23	0.22
PHOSPHATE, TOTAL mg/l	00650	4	0.028	0.040	0.028	0.020	0.023	0.028	0.035	0.035	0.020	0.033	0.020
PHOSPHATE, DISSOLVED mg/l	00653	4	0.010	0.013	0.010	0.010	0.010	0.010	0.010	0.015	0.010	0.010	0.010
CHLORIDE mg/l	00940	4	10.3	10.4	10.2	10.4	10.0	9.9	9.8	10.2	10.2	10.2	10.0
SULFATE mg/l	00945	4	20.6	20.6	21.4	21.6	21.1	21.0	20.5	21.8	21.5	21.5	21.2
PHENOLS µg/l	32730	4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
IRON µg/l	01045	4	49.3	38.5	38.8	25.5	15.3	14.0	15.0	25.3	16.3	18.3	14.3
PLATE COUNT, 48 HR. - 35°C /ml	31753	4	330	211	210	1069	186	137	68	375	85	16	58
COLIFORM, TOTAL /100 ml	31503	4	71	42	67	63	30	42	22	86	24	15	13
COLIFORM, FECAL /100 ml geo. mean	31616	4	2	2	1	2	0	0	0	2	0	1	0
STREP, FECAL /100 ml	31679	3	0	0	0	0	0	0	0	0	0	0	0
FUNGI /ml	31856	4	0.3	0.3	0.5	0.0	0.5	0.0	0.0	0.5	0.3	0.3	0.0
ACTINOMYCETES /ml	80148	4	3.0	2.5	2.5	3.3	0.0	0.0	0.3	0.5	0.5	0.0	1.0
PLANKTON /ml	60050	4	875	4860	810	525	250	585	285	325	345	620	50

TABLE 6 (CONT.)

1978 SWFP (cont.)

PARAMETER		STORET NUMBER	SUR-VEYS	ANNUAL MEAN										
				1I	3I	5I	7I	1J	2J	3J	4J	5J	6J	7J
TURBIDITY	F.T.U.	00076	4	0.90	0.81	0.85	0.54	1.48	1.43	1.21	1.22	1.39	1.44	1.21
ODOR, THRESHOLD	T.O.N.	00086	4	1.0	1.3	1.0	1.0	1.5	1.3	1.0	1.0	1.3	1.8	1.0
CONDUCTIVITY	µmhos	00095	4	294	290	293	287	294	293	300	300	295	316	301
OXYGEN DEMAND, CHEMICAL	mg/l	00335	4	11.1	8.3	8.3	9.3	7.6	13.7	10.4	10.1	10.7	10.6	13.2
pH		00400	4	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.4	8.5
RESIDUE, TOTAL NONFILTRABLE	mg/l	00530	4	7.0	7.3	7.8	4.8	6.3	7.3	9.0	13.5	7.8	11.5	12.3
NITROGEN, ORGANIC	mg/l	00605	4	0.12	0.10	0.10	0.11	0.12	0.12	0.11	0.11	0.13	0.14	0.13
NITROGEN, AMMONIA	mg/l	00610	4	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.16	0.04
NITROGEN, NITRITE-NITRATE	mg/l	00630	4	0.25	0.24	0.24	0.22	0.25	0.25	0.26	0.26	0.25	0.34	0.27
PHOSPHATE, TOTAL	mg/l	00650	4	0.040	0.015	0.023	0.015	0.035	0.045	0.033	0.018	0.018	0.023	0.018
PHOSPHATE, DISSOLVED	mg/l	00653	4	0.013	0.010	0.010	0.010	0.010	0.013	0.010	0.013	0.010	0.018	0.010
CHLORIDE	mg/l	00940	4	10.4	10.2	10.1	9.9	10.3	10.6	10.4	10.4	10.4	12.6	10.3
SULFATE	mg/l	00945	4	22.1	22.0	22.4	21.8	22.6	22.9	23.0	23.4	23.9	29.3	24.6
PHENOLS	µg/l	32730	4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
IRON	µg/l	01045	4	24.3	12.5	29.3	12.5	25.0	31.8	24.8	25.0	32.5	37.0	27.0
PLATE COUNT, 48 HR. - 35°C	/ml	31753	4	150	126	406	54	973	453	508	369	963	5775	4016
COLIFORM, TOTAL	/100 ml	31503	4	32	51	58	40	74	46	41	36	73	135	87
COLIFORM, FECAL	/100 ml geo. mean	31616	4	0	0	1	0	3	2	2	1	2	6	1
STREP, FECAL	/100 ml	31679	3	0	0	0	0	0	0	0	0	0	1	0
FUNGI	/ml	31856	4	1.0	0.5	0.3	0.0	0.8	0.0	0.0	0.5	0.0	0.8	0.5
ACTINOMYCETES	/ml	80148	4	0.8	0.8	0.3	0.0	1.5	2.5	3.0	2.0	0.3	0.5	0.8
PLANKTON	/ml	60050	4	760	410	550	180	610		1170		720	320	860

Section A (Continued)

Lake Michigan Water Quality

6. PHYTOPLANKTON MONTHLY VARIATION, 1978

PHYTOPLANKTON MONTHLY VARIATION, 1978

A monthly summary of phytoplankton data collected from the crib intake of the Jardine Water Purification Plant during 1978 is presented in Figure 7. Phytoplankton are divided into four groups: diatoms, blue-green algae, green algae and flagellated algae.

Diatoms continue to be the dominant phytoplankton group. Blue-greens and flagellates occur in lesser numbers during summer and fall and green algae occur only in very low concentrations throughout the year. Levels of less than 10 cells/ml are designated by letter only and are not accompanied by a line.

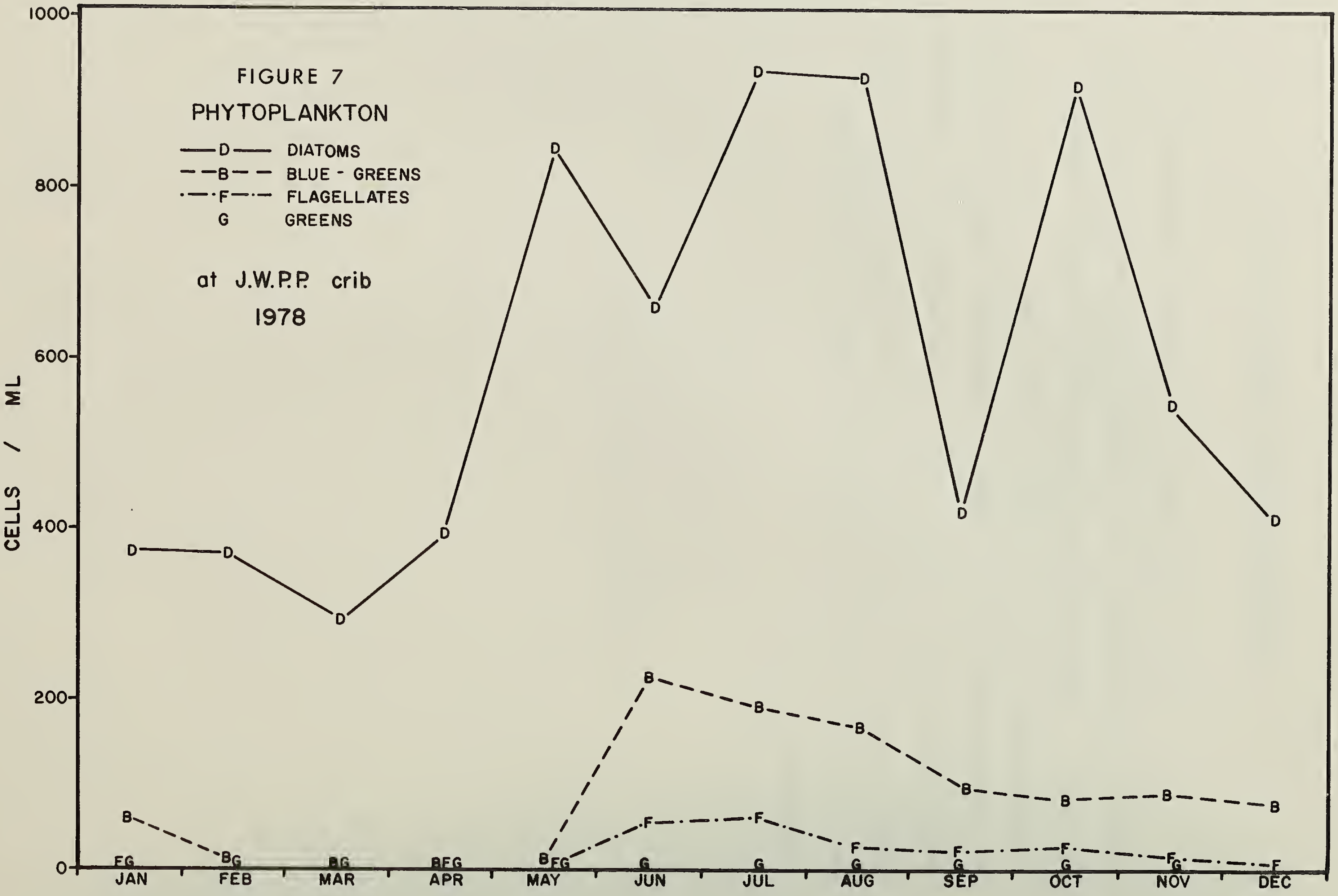


FIGURE 7

PHYTOPLANKTON

at J.W.P.P. crib

1978

Section B

TEN-YEAR TREND ANALYSES

TEN - YEAR WATER QUALITY TRENDS

The Water Quality Surveillance Section's Lake Michigan Lake Survey Program concluded its 10th year in 1978. Since its inception in 1968, the program has been modified, expanded and improved to reach its present form. Although many of the parameters which are currently a part of sample analyses have been added recently, sufficient data has been collected since 1968 to determine longer-term water quality trends for total and fecal coliform, total phosphorus, ammonia nitrogen and phytoplankton.

Ten-year trends for these parameters are presented in the following figures. Lake Survey data is summarized separately for the North Shore and South Shore Lake Surveys so that these may be compared.

Total Coliform   Total coliform levels have dropped very significantly along the north shore during the past ten years, probably as a direct result of the elimination or diversion of sewage treatment plant effluents in the area during this period. However, no improvement in the high levels of total coliform along the south shore has occurred. Levels have remained in the same general range for the past 10 years with considerable year-to-year variation. Average levels obtained from the Open Water Survey, initiated in 1977, are presented for comparison (Figure 8).

Fecal coliform   Levels of fecal coliform are considerably higher along the south shore than along the north shore. The geometric means for both surveys are below the water quality standard limit of

20/100 ml, but individual survey point geometric means along the south shore often exceed this standard. No significant change in fecal coliform levels over the past 10 years is apparent. Open Water Survey annual means were 0/100 ml for 1977 and 1978 (Figure 9).

Total phosphate A significant decrease in total phosphate levels is apparent in 1978 for both the north shore and south shore areas. Future surveillance will determine if this is a long-term trend or short-term variation. Levels during 1978 have approached the water quality standard limit of 0.021 mg/l of phosphate (equivalent to the water quality standard for phosphorus (as P) of 0.007 mg/l) with prior levels being considerably in excess of the limit. Surprisingly, little difference is apparent between north shore and south shore levels (Figure 10).

Ammonia nitrogen Ammonia nitrogen levels have decreased gradually over the past 10 years with levels along the north shore dropping below the water quality standard limit of 0.02 mg/l for the past three years. Levels along the south shore, although decreasing, are still in excess of the standard. The decreasing levels are probably the result of elimination or diversion of sewage treatment plant effluents along the north shore and improvements in wastewater treatment facilities along the south shore (Figure 11).

Phytoplankton Phytoplankton data collected at the Jardine Water Purification Plant during the past ten years are divided into four major groups: diatoms, blue-green algae, green algae and flagellated algae. Analysis of data shows that diatoms, although overwhelmingly dominant in this area of Lake Michigan, have declined very significantly during the past ten years, probably as a result of gradual silica depletion in the lake (Figure 12).

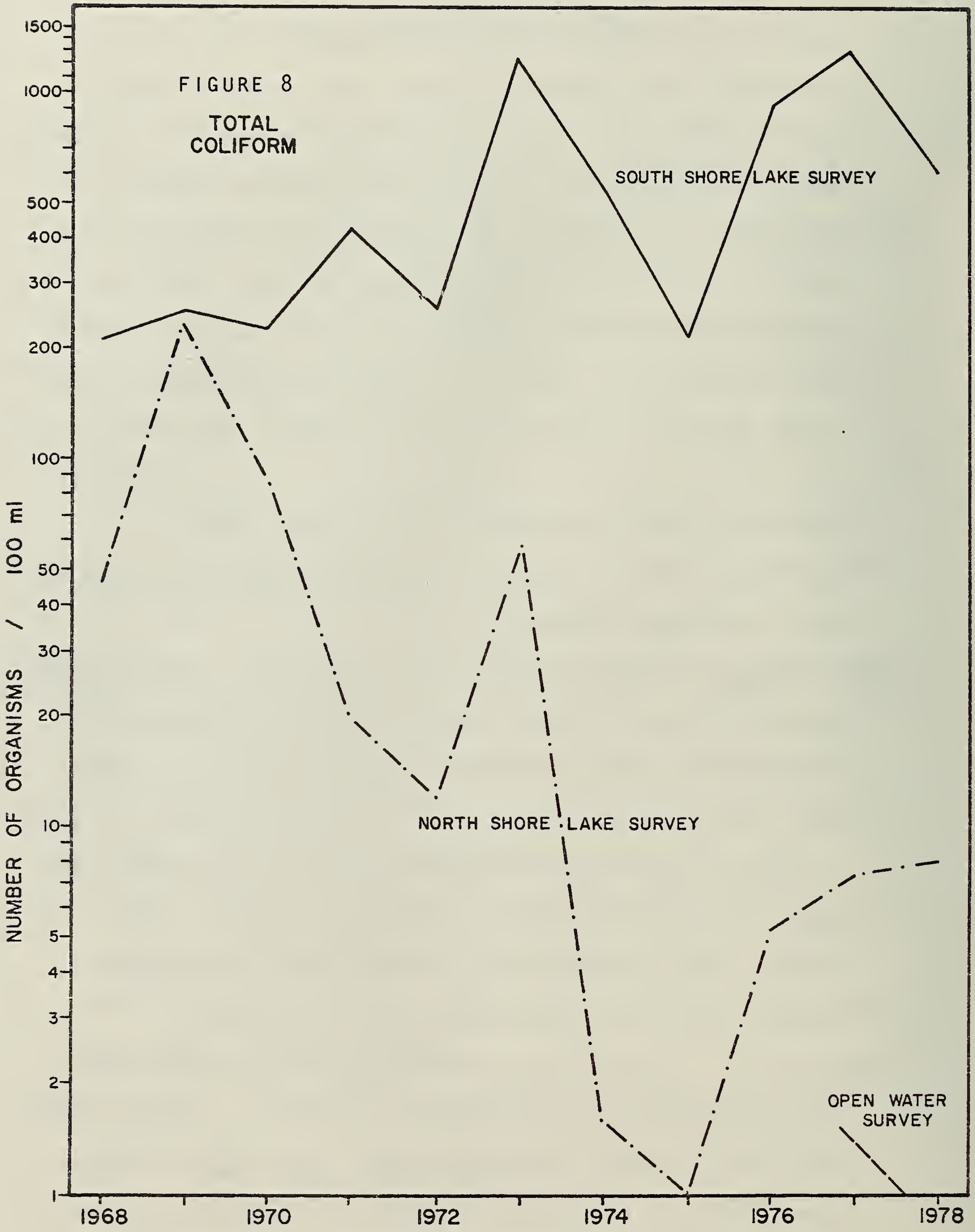
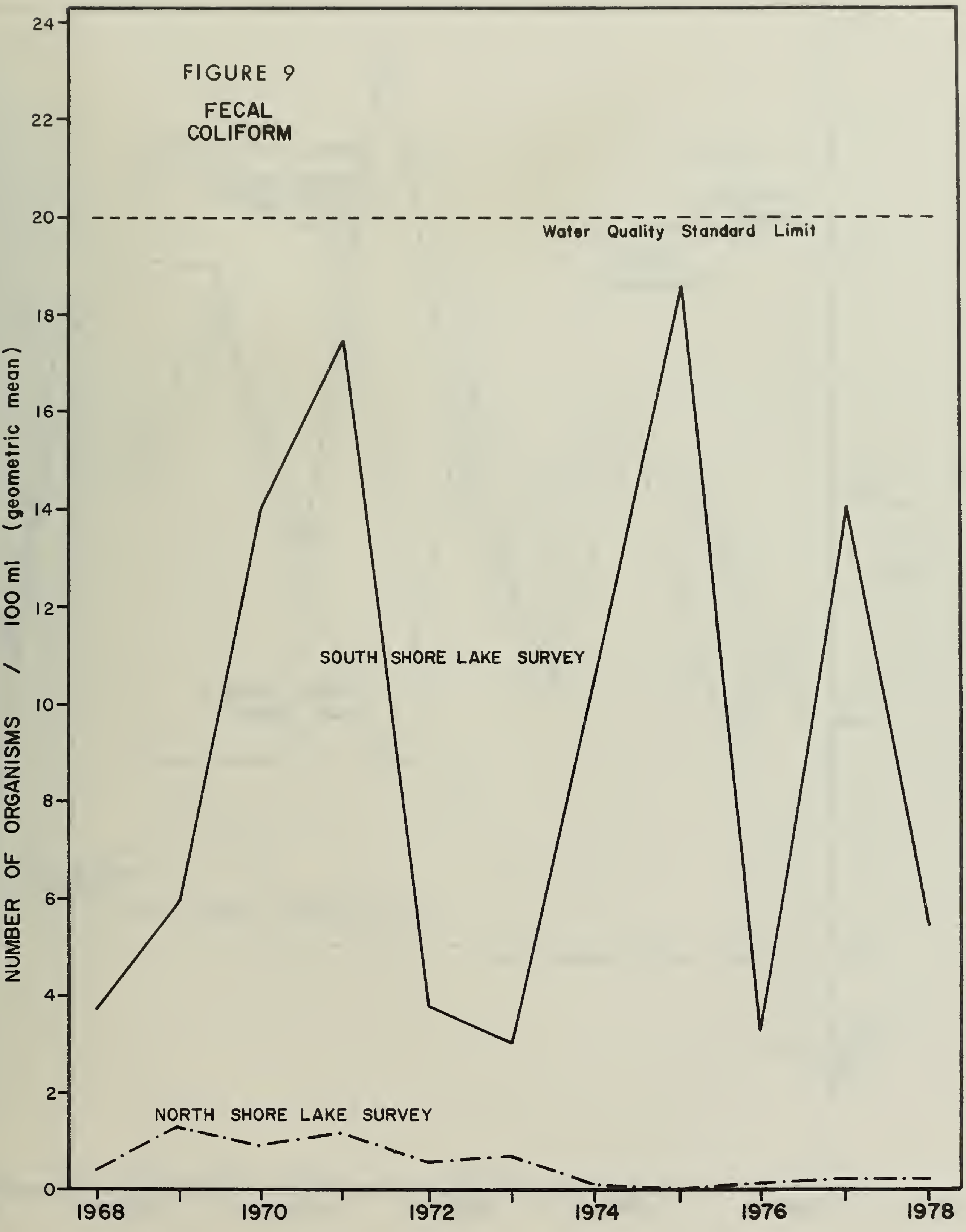
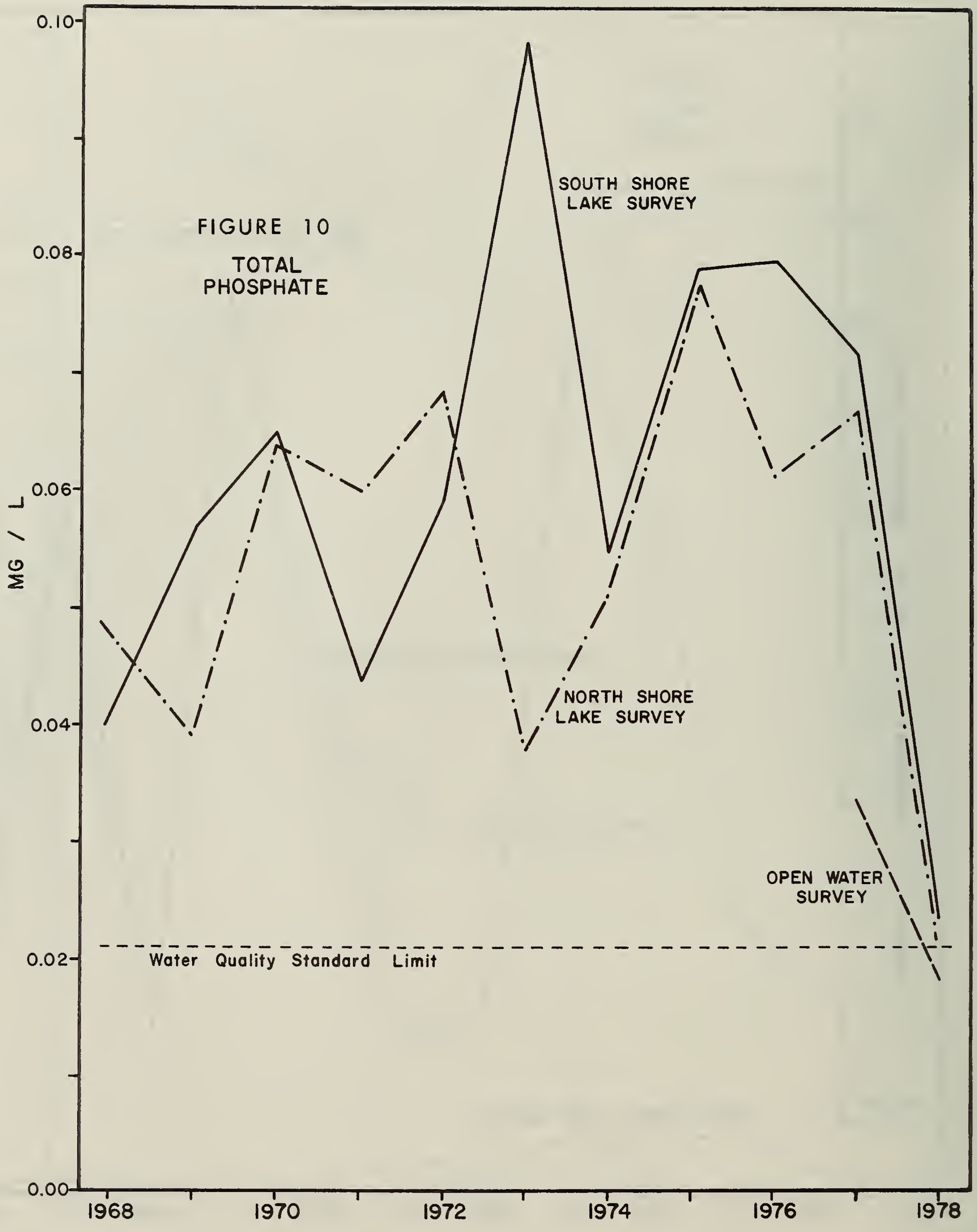


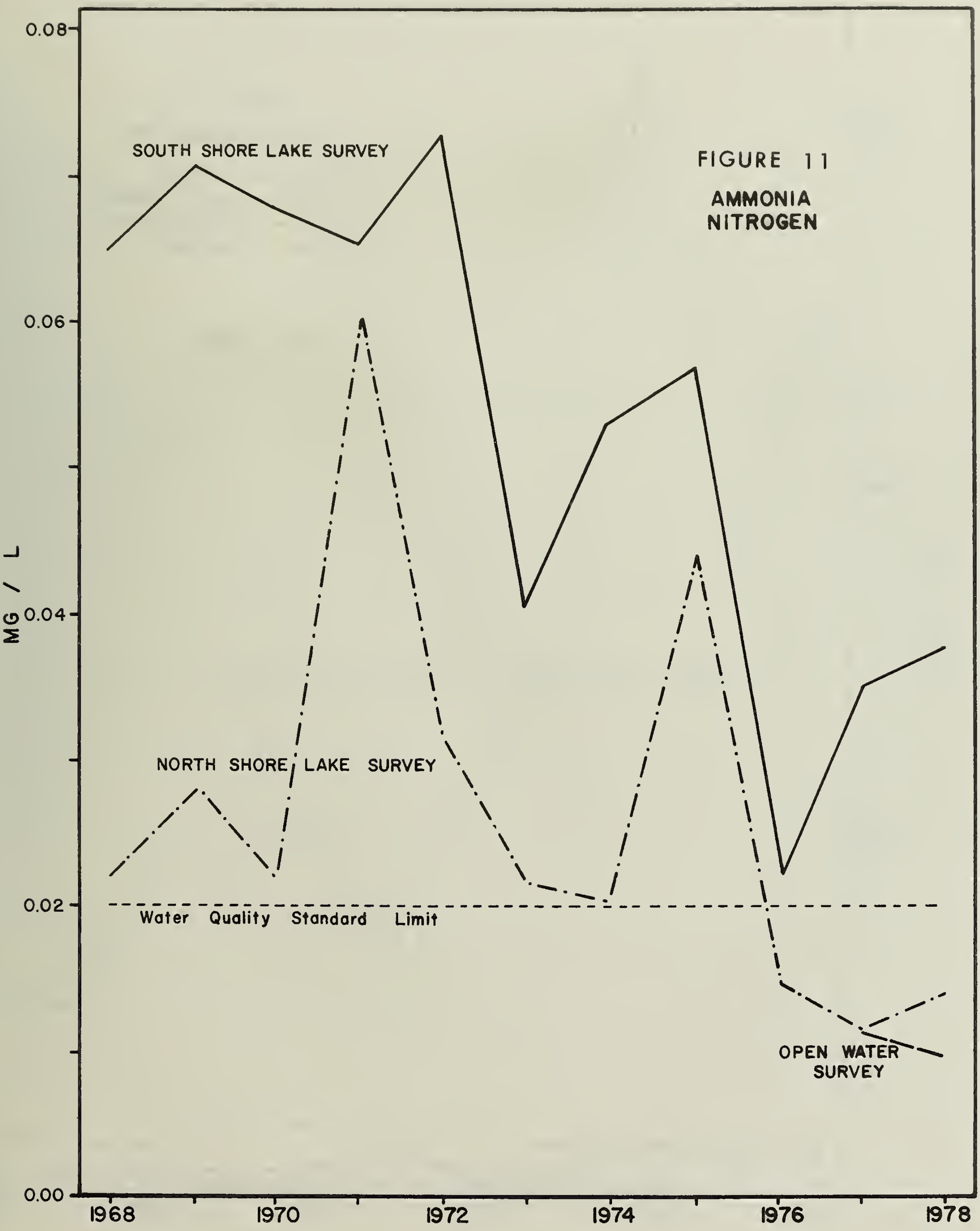
FIGURE 8
TOTAL COLIFORM
SOUTH SHORE LAKE SURVEY
NORTH SHORE LAKE SURVEY
OPEN WATER SURVEY
NUMBER OF ORGANISMS / 100 ml
1500
1000
500
400
300
200
100
50
40
30
20
10
5
4
3
2
1
1968
1970
1972
1974
1976
1978



WATER QUALITY SURVEILLANCE SECTION



WATER QUALITY SURVEILLANCE SECTION

FIGURE 11
AMMONIA NITROGEN
SOUTH SHORE LAKE SURVEY
NORTH SHORE LAKE SURVEY
OPEN WATER SURVEY
Water Quality Standard Limit
MG / L
0.08
0.06
0.04
0.02
0.00
1968
1970
1972
1974
1976
1978

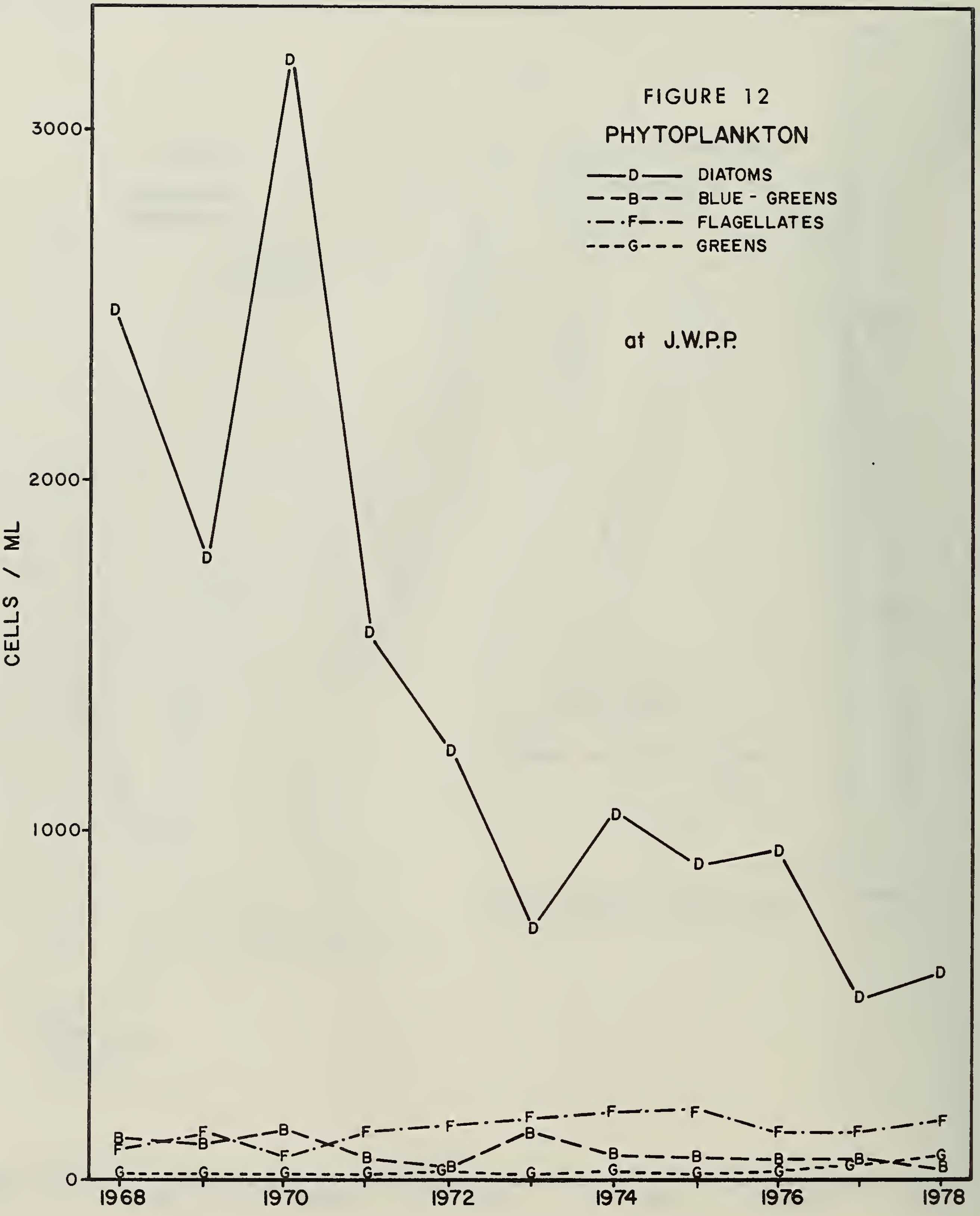


FIGURE 12

PHYTOPLANKTON

at J.W.P.P.

Section C

ILLINOIS DISCHARGES AND POLLUTIONAL SOURCES

Section C

Illinois Discharges and Pollutional Sources

Abbott Laboratories (Manufacturer of pharmaceutical products)

In September of 1976 Abbott diverted its wastewater discharge from Lake Michigan to the North Shore Sanitary District sewage treatment plant in Gurnee. Cooling water continues to be discharged to Lake Michigan.

Commonwealth Edison Company, Waukegan Station
(Fossil-fueled power generating station)

This plant has been in operation since 1927. It utilizes Lake Michigan water for condenser cooling and discharges heated cooling water back to the lake. The maximum temperature rise through the condensers is 12°F. This station also has an ash pond discharge to the lake.

The facility has successfully demonstrated that their thermal discharge will not have a detrimental effect on the ecology of Lake Michigan and the request for relief from closed cycle cooling (off-stream cooling requirements) has been approved by the United States Environmental Protection Agency and the Illinois Pollution Control Board. Treatment facilities to bring miscellaneous, non-thermal discharges (including ash and coal pile handling systems) into compliance with applicable standards have been permitted by the Agency and construction is estimated to be completed in April, 1978.

Commonwealth Edison Company, Zion Station
(nuclear-fueled power generating station)

Initial plant operation began in 1972. This station utilizes Lake Michigan water for condenser cooling and discharges heated cooling water back to the lake. The maximum temperature rise through the condensors is 20°F.

The facility has successfully demonstrated and received approval regarding its thermal discharges. Non-thermal discharge treatment facilities, permitted by the Agency, have been completed and started operation on October 1, 1978.

Federal Installations

The Great Lakes Naval Training Center diverted its wastewater discharge from Lake Michigan to the North Shore Sanitary District's Gurnee sewage treatment plant in July, 1976.

The sewage treatment plant at Fort Sheridan was abandoned at the end of 1977 when wastewaters were diverted to the North Shore Sanitary District Gurnee treatment plant.

Johnson Outboards, Division of Outboard Marine Corporation
(manufacturer of outboard motors)

Johnson Outboards has one discharge of treated process wastewater to Waukegan Harbor. Numerous other outfalls discharge non-contact cooling water, yard runoff and roof drain waters. One discharge enters Lake Michigan via a ditch located several hundreds yards north of the manufacturing facility and the others discharge into Lake Michigan, via Waukegan Harbor. In-plant treatment consists of oil separation, metal reduction and removal.

During 1975 and 1976 polychlorinated biphenyls (PCB's) were found in several discharges. The PCB's had been previously used as a hydraulic fluid in die cast machines. Studies are continuing to determine the degree of PCB contamination in Waukegan Harbor and the ditch bottom sediments.

MSDGC Overflows

Sewage from all of the Lake Shore municipalities in Cook County is treated by sewage treatment facilities of the Metropolitan Sanitary District of Greater Chicago. The treated effluents are discharged to a system of waterways that are tributary to the Des Plaines River. Historically, the Chicago River and the Calumet River were tributaries of Lake Michigan. However, with the repeated outbreaks of waterborne disease epidemics experienced by Chicago in the late 1800's caused by contamination of the City's drinking water by the flow of polluted river water into the lake, the District constructed a canal system which reversed the direction of flow, diverting flows from Lake Michigan to the Mississippi River via the Des Plaines and Illinois Rivers.

Dilution of these waste flows is provided by diversion of water from Lake Michigan at three points: 1) Wilmette Pumping Station, 2) Chicago River Controlling Works and 3) the O'Brien Lock and Dam. The average diversion, for the accounting year ending February, 1978, from the Lake Michigan watershed to the Des Plaines River Watershed was 2524 CFS. This consisted of 1) 1689 CFS of domestic pumpage, 2) 483 CFS of storm runoff water and 3) 352 CFS of direct diversion.

Water levels in the waterways are regulated by the District's lock and dam facility at Lockport, Illinois. Whenever heavy rains are predicted the Lockport dam is opened, lowering the water levels to prevent flood damage. However, during severe rains, the capacity of the waterways to drain away runoff may be exceeded and one or more of the three locks may be opened causing polluted flood waters to reach the lake.

The following indicates the dates, locations, and volumes released during flow reversals in recent years:

DATE	LOCATION	(Millions of Cubic Feet)
September 17, 1978	Wilmette	13.2
September 13, 1978	Wilmette	4.4
June 30, 1977	Chicago River	39.7
June 30, 1977	Wilmette	3.9
June 11, 1977	Wilmette	5.4
April 24, 1976	Wilmette	18.0
August 21, 1975	Wilmette	17.4
April 18, 1975	Chicago River	151.0
April 18, 1975	Wilmette	12.0
September 17, 1972	Wilmette	12.0
August 25, 1972	Chicago River	7.9
August 25, 1972	Wilmette	25.5
June 14, 1972	Wilmette	2.7

The District is in the construction stage of Phase I of a long-term construction program to control flooding and backflows. The tunnel and Reservoir Plan adopted by the District consists of a system of conveyance tunnels and storage reservoirs to transport and store combined sewage flow during periods of heavy rainfall. Subsequently, these flows, which are presently discharged to the waterways, would be pumped to the District's facilities for treatment.

North Shore Sanitary District (N.S.S.D.)

The Waukegan sewage treatment plant was the only remaining North Shore Sanitary District dry weather discharge to Lake Michigan. The discharge was diverted into the Des Plaines River in May 1978. The wet weather overflow to Lake Michigan at Lake Forest was sealed June 13, 1978. Both the North Chicago and Waukegan treatment plants are designed and permitted to discharge excess wet weather flows after settling and disinfection into Lake Michigan.

United States Steel Corporation, Waukegan Works
(producer of stainless and carbon steel wire and springs)

In July 1977 the facility completed a program diverting all process waters, after pre-treatment, to the North Shore Sanitary District. Only cooling waters continue to be discharged to Lake Michigan.

United States Steel, South Works (steel smelting plant)

A closed cycle system for contaminated water was completed in December, 1975. Blowdown from the process wastewater closed cycle system is discharged to Metropolitan Sanitary District of Greater Chicago collection system. Only non-contact cooling water is discharged from this plant to Lake Michigan and the Calumet River.

Water Plant Wastes

In the summer of 1977, wastewaters discharged to Lake Michigan from the City of Chicago Jardine Water Purification and South Water Filtration Plants were diverted to Metropolitan Sanitary District of Greater Chicago sewage treatment plants.

In Lake County the remaining water filtration plants discharging wastewaters to Lake Michigan at Waukegan, Highwood and Highland Park are regulated by National Pollutant Discharge Elimination System permits which include compliance schedules requiring either diversion of wastes to municipal sewage treatment plants or the construction of on-site treatment facilities necessary to meet applicable discharge standards.

Appendix A

INDIVIDUAL SURVEY DATA SHEETS

TABLE 7

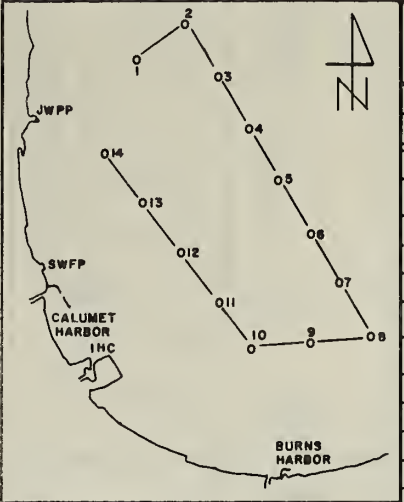
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

CHICAGO-LAKE MICHIGAN OPEN WATER SURVEY

DATE March 21, 19 78



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	13	14
		CHW-201	CHW-202	CHW-203	CHW-204	CHW-205	CHW-206	CHW-207	CHW-208	CHW-209	CHW-210	CHW-211	CHW-212	CHW-213	CHW-214
TIME		0922	0940	0958	1016	1034	1052	1110	No Sample -- Ice Pack			1149	1207	1225	1243
TEMPERATURE °C	00010	1	1	1	1	1	1	1				1	1	1	1
TURBIDITY F.T.U.	00076	0.25	0.30	0.30	0.30	0.30	0.25	0.30				0.30	0.25	0.30	0.30
ODOR, THRESHOLD	00086	IM	IM	IM	IM	IM	IM	IM				IM	IM	IM	IM
pH	00400	8.0	8.2	8.2	8.2	8.3	8.3	8.3				8.3	8.3	8.3	8.4
SULFATE mg/l	00945	22.0	20.9	22.2	22.5	22.5	21.5	22.6				23.2	22.6	22.8	22.6
CHLORIDE mg/l	00940	11.5	11.2	11.0	11.0	10.8	10.6	11.2				11.2	11.2	11.2	11.2
PHOSPHATE, TOTAL mg/l	00650	0.04	0.04	0.03	0.04	0.03	0.02	0.04				0.03	0.03	0.03	0.02
PHOSPHATE, DISSOLVED mg/l	00653	0.02	0.02	0.02	0.02	0.01	0.01	0.02				0.01	0.01	0.01	<0.01
SILICA mg/l	00956	0.7	1.0	1.0	0.8	0.8	0.8	0.8				0.8	0.8	0.8	0.8
POTASSIUM mg/l	00937	1.1	1.0	1.0	1.0	1.0	1.1	1.1				1.0	1.0	1.0	1.1
SODIUM mg/l	00929	5.2	5.2	5.0	5.0	5.0	5.0	5.0				4.7	4.2	4.2	4.7
CONDUCTIVITY μ mhos	00095	305	295	295	300	295	290	295				295	295	285	285
RESIDUE, FILTRABLE mg/l	00515	174	163	161	155	163	167	174				165	155	153	157
RESIDUE, NONFILTRABLE mg/l	00530	1	12	8	6	6	4	1				5	1	4	1
OXYGEN DEMAND, CHEMICAL mg/l	00335	26.0	15.0	14.0	14.0	16.0	29.0	16.0				25.0	21.0	16.0	29.0
NITROGEN, AMMONIA mg/l	00610	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.21	0.23	0.21	0.24	0.22	0.21	0.21				0.22	0.20	0.21	0.20
NITROGEN, ORGANIC mg/l	00605	0.12	0.12	0.12	0.16	0.16	0.16	0.12				0.08	0.12	0.16	0.12
PLATE COUNT 48hr., 35°C PER ml.		0	1	1	0	0	0	0				0	0	0	0
MF-TC PER 100 ml.	31503	0	0	0	0	0	0	0				0	0	0	0
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0				0	0	0	0
MF-FS PER 100 ml.	31679	0	0	0	0	0	0	0				0	0	0	0
PLANKTON PER ml.	60050	20	0	220	0	60	0	160				20	80	120	40
ACTINOS 14 DAY, 26°C PER ml.		0	0	0	0	0	0	0				1	0	0	0
FUNGI PER ml.		0	1	0	0	0	0	0				0	1	1	0
ASBESTOS PER l.	00948														

METEOROLOGICAL DATA

TIME		0800	0900	1000	1100	1200	1300
DIRECTION	00036	W	W	W	W	W	W
VELOCITY	00035	5	8	8	8	9	10
PREVAILING WIND	00036						

SURVEY BY M. Kniahynycky, G.S., J.E.

REMARKS:
Ice pack south of point
7 - 11 No sample

TABLE 8

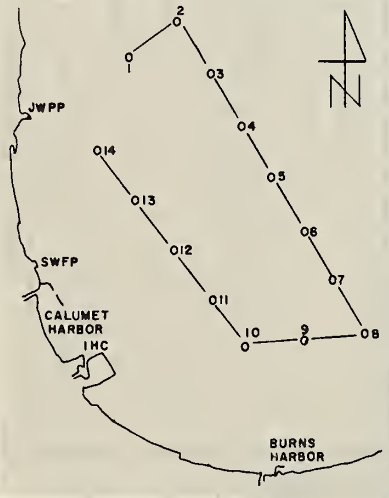
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

CHICAGO-LAKE MICHIGAN OPEN WATER SURVEY

DATE June 15, 19 78



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	13	14
TIME		0920	0938	0956	1014	1032	1050	1108	1126	1144	1202	1220	1238	1256	1314
TEMPERATURE °C	00010	13	12	11	12	12	12	14	15	15	15	15	14	14	14
TURBIDITY F.T.U.	00076	0.30	0.25	0.25	0.30	0.25	0.25	0.30	0.35	0.35	0.35	0.35	0.30	0.30	0.30
ODOR, THRESHOLD	00086	2M	1M	1M	1M	1M	1M	1M	3Df	3Df	2Df	2Df	1M	1M	1M
pH	00400	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
SULFATE mg/l	00945	20.3	21.0	21.4	21.5	22.2	22.0	22.8	24.4	24.5	24.0	24.6	24.0	23.5	23.5
CHLORIDE mg/l	00940	19.5	10.0	9.8	9.6	9.4	9.2	10.0	10.5	10.2	10.5	10.5	10.0	9.4	9.4
PHOSPHATE, TOTAL mg/l	00650	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	0.02	0.01	0.03	0.02	0.02	0.01
PHOSPHATE, DISSOLVED mg/l	00653	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
SILICA mg/l	00956	0.3	0.5	0.5	0.5	0.5	0.5	0.3	0.1	<0.1	<0.1	<0.1	0.3	0.5	0.3
POTASSIUM mg/l	00937	0.9	1.0	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0
SODIUM mg/l	00929	4.8	4.8	4.8	5.0	4.8	4.8	5.2	5.2	4.8	5.0	5.2	4.8	4.9	5.0
CONDUCTIVITY µ mhos	00095	285	285	290	290	290	290	295	300	305	305	305	295	290	290
RESIDUE, FILTRABLE mg/l	00515	152	160	164	161	158	159	175	182	168	175	170	190	166	172
RESIDUE, NONFILTRABLE mg/l	00530	6	1	1	8	2	1	4	7	10	2	10	7	5	9
OXYGEN DEMAND, CHEMICAL mg/l	00335	6.7	7.7	7.7	32.7	11.5	3.8	2.9	4.8	3.8	1.9	2.9	2.9	4.8	9.6
NITROGEN, AMMONIA mg/l	00610	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.21	0.22	0.22	0.22	0.23	0.23	0.25	0.28	0.27	0.27	0.27	0.24	0.21	0.21
NITROGEN, ORGANIC mg/l	00605	0.08	0.04	0.04	0.08	0.08	0.04	0.08	0.04	0.12	0.12	0.08	0.04	0.08	0.08
PLATE COUNT 48hr., 35°C PER ml.	31753	4	10	8	3	14	26	12	16	6	12	35	2	10	9
MF-TC PER 100 ml.	31503	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MF-FS PER 100 ml.	31679	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLANKTON PER ml.	60050	560	60	80	80	80	20	0	100	60	120	220	200	340	180
ACTINOS 14 DAY, 26°C PER ml.	80148	0	0	0	0	0	0	0	1	0	2	0	0	0	0
FUNGI PER ml.	31856	0	0	0	0	0	0	0	1	1	0	0	0	0	0
ASBESTOS PER l.	00948														

METEOROLOGICAL DATA

TIME		0800	0900	1000	1100	1200	1300
DIRECTION	00036	S	S	SW	S	S	S
VELOCITY	00035	8	9	11	13	12	11

SURVEY BY: M.Kniahynycky & J. Esposito

REMARKS

PREVAILING WIND	
00036	S

TABLE 9

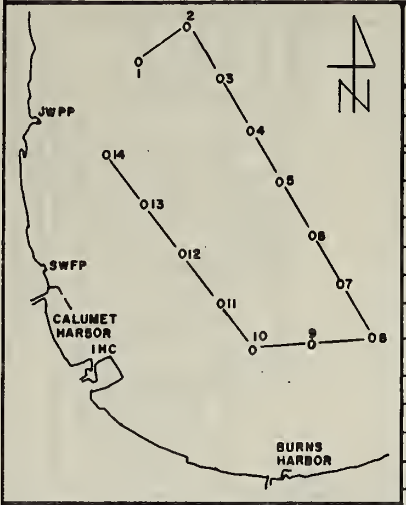
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

CHICAGO-LAKE MICHIGAN OPEN WATER SURVEY

DATE August 15, 19 78



PARAMETER	STORET NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14
TIME		0916	0934	0952	1010	1028	1046	1104	1122	1140	1158	1216	1234	1252	1310
TEMPERATURE °C	00010	22	22	22	22	22	22	22	22	22	22	22	22	22	22
TURBIDITY F.T.U.	00076	0.35	0.35	0.30	0.35	0.40	0.45	0.40	0.30	0.30	0.35	0.30	0.30	0.35	0.35
ODOR, THRESHOLD	00086	2M	1M	2M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M
pH	00400	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
SULFATE mg/l	00945	21.5	22.0	21.0	20.5	20.0	19.5	20.5	20.3	20.5	20.5	20.5	20.0	20.0	20.3
CHLORIDE mg/l	00940	8.6	8.4	8.4	8.4	8.6	8.6	9.0	8.8	9.2	8.8	9.4	9.2	8.8	9.2
PHOSPHATE, TOTAL mg/l	00650	0.01	0.03	0.01	0.02	0.02	0.02	0.03	0.01	0.02	0.01	0.01	0.02	0.01	0.08
PHOSPHATE, DISSOLVED mg/l	00653	0.01	<0.01	0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01	0.03
SILICA mg/l	00956	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
POTASSIUM mg/l	00937	1.0	1.0	1.1	1.0	1.0	1.1	1.0	1.1	1.1	1.2	1.0	1.2	1.0	1.1
SODIUM mg/l	00929	4.5	4.5	4.4	4.3	4.4	4.9	4.3	4.5	4.6	4.5	4.4	4.4	4.3	4.5
CONDUCTIVITY µ mhos	00095	290	290	285	285	280	285	285	290	290	290	290	290	290	280
RESIDUE, FILTRABLE mg/l	00515	162	156	149	155	157	152	154	152	148	149	150	152	155	153
RESIDUE, NONFILTRABLE mg/l	00530	9	9	7	1	4	1	3	2	3	4	2	5	1	5
OXYGEN DEMAND, CHEMICAL mg/l	00335	5.9	6.9	8.9	7.9	8.9	6.9	7.9	6.9	7.9	5.9	11.9	7.9	12.9	9.9
NITROGEN, AMMONIA mg/l	00610	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.21	0.20	0.19	0.19	0.17	0.16	0.19	0.20	0.21	0.21	0.21	0.22	0.23	0.22
NITROGEN, ORGANIC mg/l	00605	0.12	0.12	0.08	0.12	0.08	0.12	0.16	0.12	0.08	0.16	0.12	0.12	0.12	0.12
PLATE COUNT 48hr., 35°C PER ml.	31753	12	2	5	4	0	4	3	8	10	7	9	9	2	11
MF-TC PER 100 ml.	31503	44	6	4	0	8	0	0	0	0	0	0	2	0	2
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MF-FS PER 100 ml.	31679			— DISCONTINUED —											
PLANKTON PER ml.	60050	20	0	20	20	20	20	20	20	0	0	0	20	0	480
ACTINOS 14 DAY, 26°C PER ml.	80148	2	0	1	0	0	0	0	1	1	0	3	1	0	0
FUNGI PER ml.	31856	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ASBESTOS PER l.	00948														

METEOROLOGICAL DATA

TIME		0800	0900	1000	1100	1200	1300
DIRECTION	00036	SE	S	SE	SE	SE	SE
VELOCITY	00035	5	7	8	8	9	10

PREVAILING WIND	00036	SE

SURVEY BY: J. Esposito & G. Slowik

REMARKS:

TABLE 10

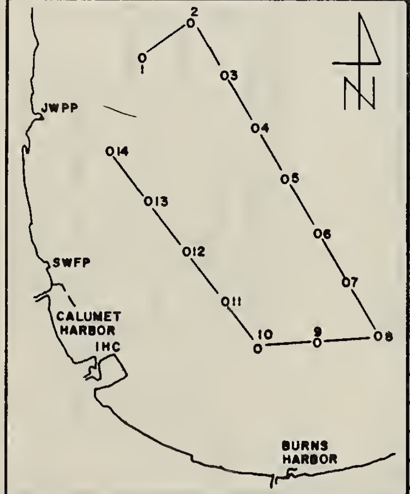
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

CHICAGO-LAKE MICHIGAN OPEN WATER SURVEY

DATE Oct. 12, 19 78



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
		CHW201	CHW202	CHW203	CHW204	CHW205	CHW206	CHW207	CHW208	CHW209	CHW210	CHW211	CHW212	CHW213	CHW214
TIME		0918	0936	0954	1012	1030	1048	1106	1124	1142	1200	1218	1236	1254	1312
TEMPERATURE °C	00010	15	15	15	15	15	15	15	14	15	15	15	15	15	15
TURBIDITY F.T.U.	00076	0.50	0.45	0.40	0.35	0.35	0.35	0.35	0.35	0.40	0.35	0.50	0.40	0.40	0.45
ODOR, THRESHOLD	00086	2G	IM	IM	IM	IDM	IM	IG	IG	IDM	IM	IM	IG	IM	IM
pH	00400	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
SULFATE mg/l	00945	22.5	21.5	22.0	21.5	22.0	22.5	21.5	19.5	21.0	21.5	21.5	22.0	21.5	22.0
CHLORIDE mg/l	00940	11.2	10.0	10.5	10.2	9.6	10.2	10.5	10.2	10.4	10.2	10.8	10.8	10.4	11.0
PHOSPHATE, TOTAL mg/l	00650	0.02	0.02	0.04	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02	<0.01	0.03	0.02
PHOSPHATE, DISSOLVED mg/l	00653	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SILICA mg/l	00956	0.4	0.6	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6
POTASSIUM mg/l	00937	0.8	0.9	0.9	0.8	0.9	0.7	0.7	0.9	0.8	0.8	0.8	0.8	1.0	1.0
SODIUM mg/l	00929	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.5	5.0	4.7	4.7	4.7
CONDUCTIVITY μ mhos	00095	275	285	285	285	285	290	285	285	285	285	285	285	285	285
RESIDUE, FILTRABLE mg/l	00515	171	177	177	177	177	180	177	177	177	177	177	177	177	177
RESIDUE, NONFILTRABLE mg/l	00530	3	8	9	5	3	1	1	1	2	5	1	3	8	6
OXYGEN DEMAND, CHEMICAL mg/l	00335	8.8	8.8	12.7	9.8	8.8	8.8	9.8	8.8	5.9	8.8	2.9	6.9	2.9	3.9
NITROGEN, AMMONIA mg/l	00610	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.22	0.23	0.22	0.21	0.23	0.24	0.24	0.26	0.23	0.23	0.26	0.22	0.22	0.22
NITROGEN, ORGANIC mg/l	00605	0.11	0.13	0.11	0.11	0.11	0.10	0.11	0.11	0.13	0.10	0.09	0.18	0.13	0.14
PLATE COUNT 48hr., 35°C PER ml.	31753	10	8	8	9	16	4	9	20	9	12	9	10	1	22
MF-TC PER 100 ml.	31503	0	2	4	2	6	2	6	0	4	0	0	2	2	0
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MF-FS PER 100 ml.	31679	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PLANKTON PER ml.	60050	460	240	180	100	80	220	80	80	140	600	320	100	160	180
ACTINOS 14 DAY, 26°C PER ml.	80148	1	0	0	0	0	1	0	0	0	0	1	0	0	0
FUNGI PER ml.	31856	0	0	0	0	0	0	0	0	0	0	0	0	1	0
ASBESTOS PER l.	00948	1	6.29×10^5	-	3.30×10^5	-	1.06×10^5	-	8.63×10^4	-	-	-	-	-	-

METEOROLOGICAL DATA

TIME		0800	0900	1000	1100	1200	1300	
DIRECTION	00036	W	W	W	W	W	NW	
VELOCITY	00035	6	5	6	5	7	13	

PREVAILING WIND	SURVEY BY: M. Kniahynycky D. Exquicinio
00036	REMARKS:
W	

TABLE 11

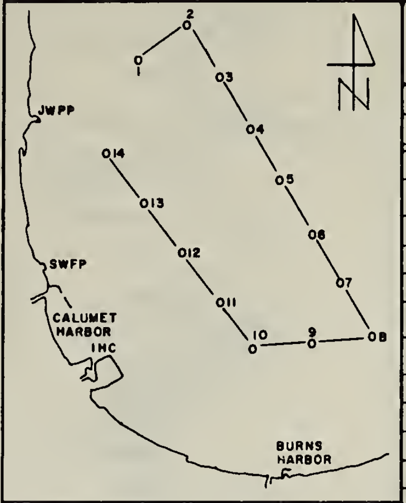
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

CHICAGO-LAKE MICHIGAN OPEN WATER SURVEY

DATE DEC. 5, 19 78



PARAMETER	STORET NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14
TIME		0924	0942	1000	1018	1036	1054	1114	1132	1150	1208	1226	1244	1302	1320
TEMPERATURE °C	00010	5	5	5	5	5	6	6	6	6	7	7	7	6	6
TURBIDITY F.T.U.	00076	0.50	0.45	0.40	0.35	0.35	0.35	0.45	0.45	0.40	0.40	0.35	0.50	0.40	0.65
ODOR, THRESHOLD	00086	2M	1M	2M	2M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M
pH	00400	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
SULFATE mg/l	00945	22.5	22.5	22.0	22.7	22.5	22.5	22.2	22.0	23.0	22.5	23.0	21.0	23.0	23.0
CHLORIDE mg/l	00940	10.0	8.4	8.4	8.2	8.4	8.2	8.4	8.3	8.4	8.4	8.6	8.6	8.6	9.4
PHOSPHATE, TOTAL mg/l	00650	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	01	0.01	0.01	0.01
PHOSPHATE, DISSOLVED mg/l	00653	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SILICA mg/l	00956	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
POTASSIUM mg/l	00937	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SODIUM mg/l	00929	4.2	4.3	4.4	4.3	4.3	4.2	4.3	4.3	4.4	4.3	4.5	4.4	4.3	4.3
CONDUCTIVITY μ mhos	00095	290	290	290	285	285	295	290	285	290	285	285	285	280	290
RESIDUE, FILTRABLE mg/l	00515	180	180	180	177	177	183	180	177	180	177	177	177	174	180
RESIDUE, NONFILTRABLE mg/l	00530	1	4	5	1	2	3	3	1	1	1	1	4	3	1
OXYGEN DEMAND, CHEMICAL mg/l	00335	9.0	13.0	6.0	7.0	6.0	6.0	6.0	6.0	6.0	4.0	9.0	5.0	8.0	9.0
NITROGEN, AMMONIA mg/l	00610	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.25	0.26	0.24	0.24	0.25	0.23	0.25	0.27	0.26	0.25	0.24	0.25	0.25	0.25
NITROGEN, ORGANIC mg/l	00605	0.18	0.16	0.19	0.18	0.18	0.18	0.15	0.18	0.15	0.15	0.19	0.18	0.10	0.18
PLATE COUNT 48hr., 35°C PER ml.	31753	22	17	19	6	7	4	7	8	17	6	11	12	19	17
MF-TC PER 100 ml.	31503	0	0	2	0	0	2	0	0	0	0	0	0	0	0
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MF-FS PER 100 ml.	31679	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PLANKTON PER ml.	60050	140	80	60	20	20	0	40	20	1100	80	40	40	1680	0
ACTINOS 14 DAY, 26°C PER ml.	80148	0	0	0	1	0	0	0	1	0	0	0	0	0	0
FUNGI PER ml.	31856	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ASBESTOS PER l.	00948														

METEOROLOGICAL DATA

TIME		0800	0900	1000	1100	1200	1300
DIRECTION	00036	SW	SW	SW	SW	W	SW
VELOCITY	00035	7	7	6	7	5	4

PREVAILING WIND 00036 SW

SURVEY BY: J. Esposito & G. Slowik

REMARKS:

TABLE 12

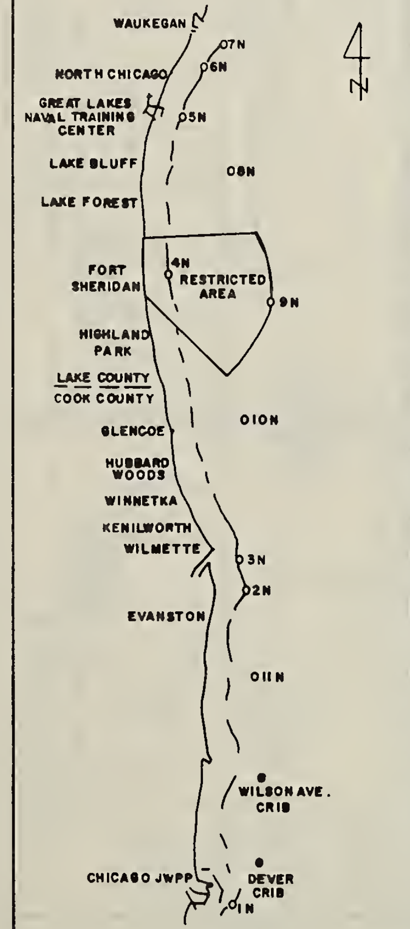
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

NORTH SHORE LAKE SURVEY

DATE April 4, ,19 78



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER									
		1N CHW013	2N CHW011	3N CHW010	5N CHW005	6N CHW004	7N CHW003	8N CHW006	9N CHW008	10N CHW009	11N CHW012
TIME		0845	0948	0954	1115	1122	1129	1057	1034	1015	0931
TEMPERATURE °C	00010	5	5	5	4	4	4	3	3	4	5
TURBIDITY F.T.U.	00076	4.4	2.5	2.6	2.1	2.6	3.0	0.70	0.55	0.95	2.0
ODOR, THRESHOLD	00086	2DM	1M	1M	2DM	3MC	1M	2M	1M	1M	1M
pH	00400	8.3	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
SULFATE mg/l	00945	26.5	25.8	25.7	27.5	26.7	26.5	25.6	23.5	24.3	24.7
CHLORIDE mg/l	00940	10.0	10.0	10.0	* 11.8	11.0	11.0	10.2	10.5	10.0	10.8
PHOSPHATE, TOTAL mg/l	00650	0.03	0.04	0.02	0.04	0.03	0.05	0.02	0.02	0.02	0.02
PHOSPHATE, DISSOLVED mg/l	00653	0.02	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01
CONDUCTIVITY µ mhos	00095	300	305	310	315	305	305	300	290	295	295
RESIDUE, NONFILTRABLE mg/l	00530	7	6	9	4	2	1	5	8	0	4
OXYGEN DEMAND, CHEMICAL mg/l	00335	9.1	7.1	8.1	10.1	7.1	9.1	7.1	7.1	5.1	10.1
NITROGEN, AMMONIA mg/l	00610	0.01	0.01	0.01	0.02	0.02	0.04	0.02	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.14	0.20	0.21	0.28	0.27	0.27	0.25	0.20	0.17	0.20
NITROGEN, ORGANIC mg/l	00605	0.08	0.08	0.12	0.40	0.16	0.12	0.24	0.12	0.08	0.08
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	<1	<1	<1	1	<1	<1	<1
PLATE COUNT 48 hr., 35 °C PER ml.		70	6	6	100	52	26	6	2	6	2
MF-TC PER 100 ml.	31503	0	0	0	2	4	0	0	0	0	0
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0	0	0	0
MF-FS PER 100 ml.	31679	0	0	0	0	0	0	0	0	0	0
PLANKTON PER ml.	60050	640	1060	700	780	420	820	300	260	520	400
ACTINOS 14 DAY, 26°C PER ml.		0	1	4	8	5	14	4	0	0	0
FUNGI PER ml.		1	1	1	3	2	0	0	0	0	0

METEOROLOGICAL DATA

								PREVAILING WIND
TIME		0800	0900	1000	1100	1200	1300	00036
DIRECTION	00036	S	SW	SW	W	N	W	W
VELOCITY	00035	7	9	11	13	7	6	

SURVEY BY: MK, JE, & GS

REMARKS: * Checked

TABLE 13

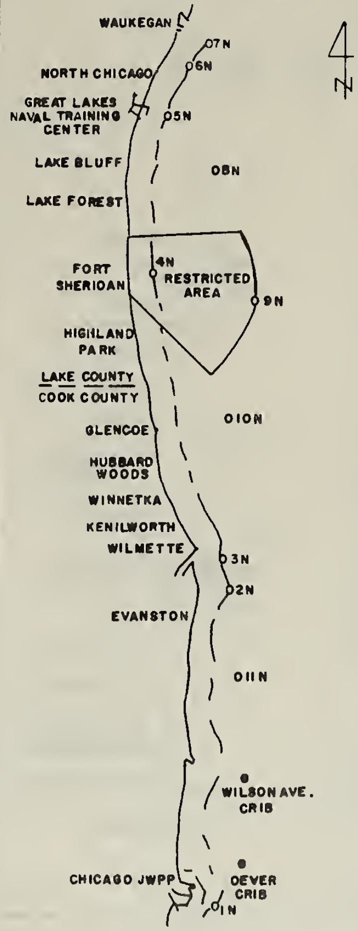
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

NORTH SHORE LAKE SURVEY

DATE May 9, ,19 78



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER									
		1N	2N	3N	5N	6N	7N	8N	9N	10N	11N
		CHW013	CHW011	CHW010	CHW005	CHW004	CHW003	CHW006	CHW008	CHW009	CHW012
TIME		0850	0948	0957	1112	1119	1124	1101	1038	1019	0930
TEMPERATURE °C	00010	9	9	9	6	7	7	6	6	6	9
TURBIDITY F.T.U.	00076	5.7	5.3	3.4	0.80	2.7	3.0	0.90	0.55	0.95	4.3
ODOR, THRESHOLD	00086	3Df	2DM	1DM	2M	1M	1M	1M	1M	1M	1M
pH	00400	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
SULFATE mg/l	00945	24.5	22.8	22.3	21.2	22.0	22.5	21.5	21.5	22.0	23.0
CHLORIDE mg/l	00940	13.0	13.0	13.0	10.8	12.0	13.0	10.5	10.8	10.8	13.0
PHOSPHATE, TOTAL mg/l	00650	0.05	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02
PHOSPHATE, DISSOLVED mg/l	00653	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02
CONDUCTIVITY µ mhos	00095	315	305	305	270	300	305	275	280	285	295
RESIDUE, NONFILTRABLE mg/l	00530	10	13	15	6	7	1	9	14	8	8
OXYGEN DEMAND, CHEMICAL mg/l	00335	16.4	18.4	15.4	12.3	14.3	17.3	17.4	18.4	14.3	18.4
NITROGEN, AMMONIA mg/l	00610	0.01	0.02	0.07	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.49	0.37	0.34	0.25	0.29	0.32	0.24	0.24	0.24	0.31
NITROGEN, ORGANIC mg/l	00605	0.20	0.16	0.20	0.16	0.12	0.16	0.16	0.12	0.16	0.12
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48 hr., 35 °C PER ml.		79	20	16	14	28	29	13	43	28	13
MF-TC PER 100 ml.	31503	0	0	0	0	0	0	0	0	0	0
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0	0	0	0
MF-FS PER 100 ml.	31679	0	0	0	0	0	0	0	0	0	0
PLANKTON PER ml.	60050	1740	3620	2080	1460	640	1040	540	1160	620	2920
ACTINOS 14 DAY, 26°C PER ml.		6	9	5	2	4	1	0	0	0	0
FUNGI PER ml.		0	0	0	0	0	0	0	0	0	0

METEOROLOGICAL DATA									PREVAILING WIND
TIME		0800	0900	1000	1100	1200	1300		00036
DIRECTION	00036	SW	SW	SW	SW	W	W		SW
VELOCITY	00035	11	11	11	13	12	13		

SURVEY BY: G. Slowik & B. Ferguson

REMARKS:

TABLE 14

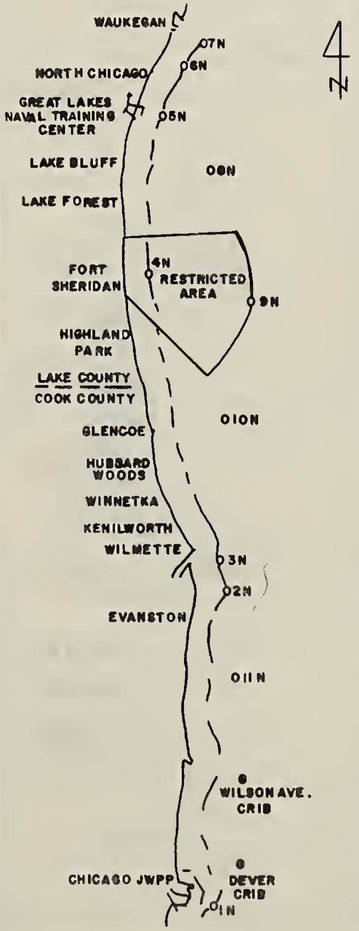
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

NORTH SHORE LAKE SURVEY

DATE June 27, 19 78



PARAMETER		STORET NUMBER	SAMPLING POINT AND STATION NUMBER									
			1N CHW013	2N CHW011	3N CHW010	5N CHW005	6N CHW004	7N CHW003	8N CHW006	9N CHW008	10N CHW009	11N CHW012
TIME			0848	0946	0952	1113	1120	1130	1056	1033	1014	0929
TEMPERATURE	°C	00010	14	13	13	13	13	13	15	16	16	14
TURBIDITY	F.T.U.	00076	0.70	0.50	0.55	1.4	1.5	1.2	0.40	0.40	0.45	0.50
ODOR, THRESHOLD		00086	4Df	3Df	3Df	3DM	2DM	1M	2DM	2DM	2Df	2Df
pH		00400	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.5	8.5	8.5
SULFATE	mg/l	00945	18.7	27.5	18.5	18.5	19.5	19.0	18.5	19.0	19.7	18.0
CHLORIDE	mg/l	00940	9.6	9.0	8.6	8.8	8.2	8.6	8.4	9.0	9.4	8.6
PHOSPHATE, TOTAL	mg/l	00650	0.02	0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.02	0.02	0.03
PHOSPHATE, DISSOLVED	mg/l	00653	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
CONDUCTIVITY	µ mhos	00095	275	285	295	290	290	290	285	290	295	295
RESIDUE, NONFILTRABLE	mg/l	00530	2	2	17	7	2	13	2	1	1	1
OXYGEN DEMAND, CHEMICAL	mg/l	00335	15.4	16.3	21.2	15.4	14.4	14.4	13.5	10.6	10.6	16.3
NITROGEN, AMMONIA	mg/l	00610	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE	mg/l	00630	0.26	0.22	0.23	0.24	0.23	0.25	0.23	0.23	0.25	0.25
NITROGEN, ORGANIC	mg/l	00605	0.10	0.16	0.12	0.12	0.12	0.12	0.10	0.12	0.12	0.16
PHENOL-LIKE SUBSTANCES	µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48 hr., 35°C PER ml.		31753	200	17	25	41	33	23	2	7	11	17
MF-TC PER 100ml.		31503	14	48	84	12	4	4	0	6	8	4
MF-FC PER 100ml.		31616	0	0	0	0	0	0	0	0	0	0
MF-FS PER 100ml.		31679	0	0	0	0	0	0	0	0	0	0
PLANKTON PER ml.		60050	1440	1040	1580	780	1240	1220	700	460	980	760
ACTINOS 14 DAY, 26°C PER ml.		80148	1	2	0	1	2	1	0	1	1	0
FUNGI PER ml.		31856	0	0	1	4	4	5	0	3	0	0

METEOROLOGICAL DATA									PREVAILING WIND
TIME		0800	0900	1000	1100	1200	1300	1400	00036
DIRECTION	00036	W	W	NW	N	NE	E	E	W
VELOCITY	00035	7	8	6	2	2	5	6	

SURVEY BY: J. Esposito & J. Shadle

REMARKS:

TABLE 15

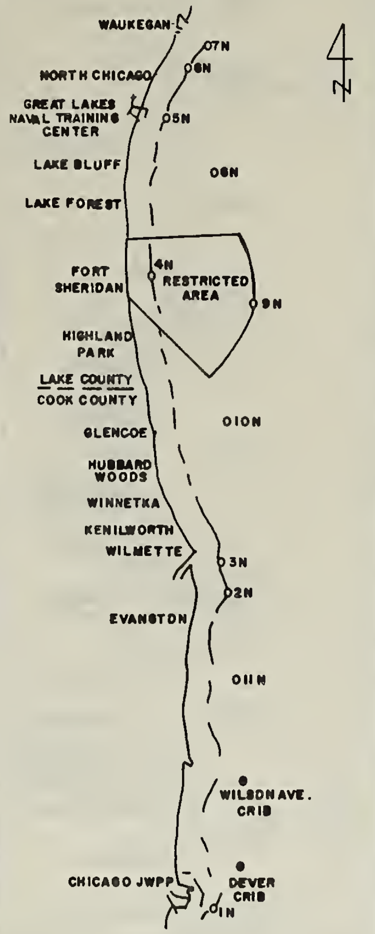
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

NORTH SHORE LAKE SURVEY

DATE July 25, 19 78



PARAMETER		STORET NUMBER	SAMPLING POINT AND STATION NUMBER										
			1N CHW013	2N CHW011	3N CHW010	5N CHW005	6N CHW004	7N CHW003	8N CHW006	9N CHW008	10N CHW009	11N CHW012	
TIME			0845	0940	0952	1112	1119	1131	1056	1033	1014	0926	
TEMPERATURE	°C	00010	19	19	19	19	19	19	20	20	19	19	
TURBIDITY	F.T.U.	00076	0.50	0.50	0.50	0.45	0.45	0.50	0.40	0.45	0.50	0.50	
ODOR, THRESHOLD		00086	2M	1M	1M	2M	1M	2M	1M	1M	1M	1M	
pH		00400	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	
SULFATE	mg/l	00945	19.3	21.2	20.5	21.0	22.0	21.0	21.5	21.0	22.0	22.3	
CHLORIDE	mg/l	00940	10.5	10.0	9.4	11.2	9.4	9.6	9.2	9.0	9.4	9.2	
PHOSPHATE, TOTAL	mg/l	00650	<0.01	<0.01	<0.01	<0.01	0.02	0.03	<0.01	0.08	0.03	<0.01	
PHOSPHATE, DISSOLVED	mg/l	00653	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	0.01	<0.01	
CONDUCTIVITY	µ mhos	00095	285	290	290	285	290	285	290	290	290	290	
RESIDUE, NONFILTRABLE	mg/l	00530	6	5	2	1	1	3	3	4	1	3	
OXYGEN DEMAND, CHEMICAL	mg/l	00335	7.1	8.1	8.1	7.1	7.1	6.1	6.1	6.1	8.1	8.1	
NITROGEN, AMMONIA	mg/l	00610	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	
NITROGEN, NITRITE-NITRATE	mg/l	00630	0.26	0.25	0.26	0.24	0.24	0.23	0.24	0.25	0.25	0.25	
NITROGEN, ORGANIC	mg/l	00605	0.12	0.16	0.12	0.08	0.12	0.12	0.12	0.16	0.08	0.16	
PHENOL-LIKE SUBSTANCES	µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
PLATE COUNT 48 hr., 35 °C PER ml.		31753	92	35	16	8	22	14	12	12	20	2	
MF-TC PER 100 ml.		31503	4	0	0	0	0	0	2	0	0	2	
MF-FC PER 100 ml.		31616	0	0	0	0	0	0	0	0	0	0	
MF-FS PER 100 ml.		31679	0	0	0	0	0	0	0	0	0	0	
PLANKTON PER ml.		60050	460	40	1220	260	60	0	380	380	660	400	
ACTINOS 14 DAY, 26°C PER ml.		80148	2	0	2	0	0	0	0	0	0	0	
FUNGI PER ml.		31856	0	0	0	1	0	0	0	0	2	0	

METEOROLOGICAL DATA									PREVAILING WIND
TIME		0800	0900	1000	1100	1200	1300	1400	00036
DIRECTION	00036	W	W	SW	S	S	S	SW	SW
VELOCITY	00035	6	9	6	12	8	12	10	

SURVEY BY: J. Esposito & J. Shadle

REMARKS:

TABLE 16

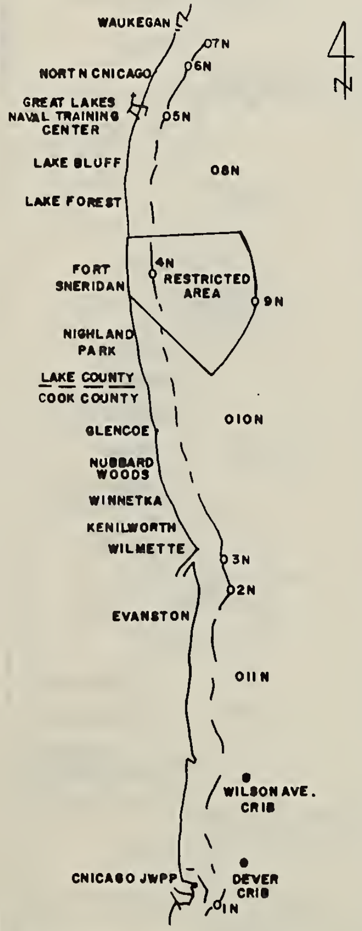
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

NORTH SHORE LAKE SURVEY

DATE August 8, 19 78



PARAMETER	STORET NUMBER	1N CHW013	2N CHW011	3N CHW010	5N CHW005	6N CHW004	7N CHW003	8N CHW006	9N CHW008	10N CHW009	11N CHW012
TIME		0854	0954	0958	1125	1132	1139	1102	1039	1020	0933
TEMPERATURE °C	00010	19	19	18	18	18	18	19	19	19	18
TURBIDITY F.T.U.	00076	0.70	0.55	0.55	0.50	0.60	0.80	0.45	0.40	0.80	0.55
ODOR, THRESHOLD	00086	3M	2M	1M	1M	1M	1M	1M	1M	1M	1M
pH	00400	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
SULFATE mg/l	00945	21.3	21.0	20.8	19.8	20.2	20.0	22.5	18.9	20.0	20.0
CHLORIDE mg/l	00940	9.4	9.4	9.2	9.8	9.8	9.6	9.8	9.6	9.6	9.2
PHOSPHATE, TOTAL mg/l	00650	0.01	0.01	<0.01	0.01	<0.01	0.01	0.01	<0.01	0.03	0.01
PHOSPHATE, DISSOLVED mg/l	00653	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01
CONDUCTIVITY µ mhos	00095	280	285	295	290	285	290	290	290	290	295
RESIDUE, NONFILTRABLE mg/l	00530	6	1	2	1	7	6	3	1	6	2
OXYGEN DEMAND, CHEMICAL mg/l	00335	6.7	6.7	6.7	6.7	5.8	5.8	6.7	4.8	6.7	6.7
NITROGEN, AMMONIA mg/l	00610	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.23	0.22	0.22	0.20	0.21	0.22	0.21	0.20	0.26	0.27
NITROGEN, ORGANIC mg/l	00605	0.12	0.16	0.16	0.16	0.28	0.36	0.28	0.36	0.20	0.12
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48 hr., 35 °C PER ml.	31753	210	24	18	14	19	25	15	20	18	35
MF-TC PER 100ml.	31503	12	14	0	2	8	0	20	20	14	6
MF-FC PER 100ml.	31616	0	0	0	0	0	0	0	0	0	0
MF-FS PER 100 ml.	31679	0	0	0	0	0	0	0	2	0	0
PLANKTON PER ml.	60050	-	-	-	-	-	-	-	-	-	-
ACTINOS 14 DAY, 26°C PER ml.	80148	1	1	0	0	3	1	0	1	1	0
FUNGI PER ml.	31856	0	0	0	1	0	0	0	0	0	0

METEOROLOGICAL DATA

							PREVAILING WIND
TIME		0800	0900	1000	1100	1200	00036
DIRECTION	00036	SW	SW	SW	SW	SW	SW
VELOCITY	00035	15	10	8	10	9	

SURVEY BY: J. Esposito & G. Slowik

REMARKS:

TABLE 17

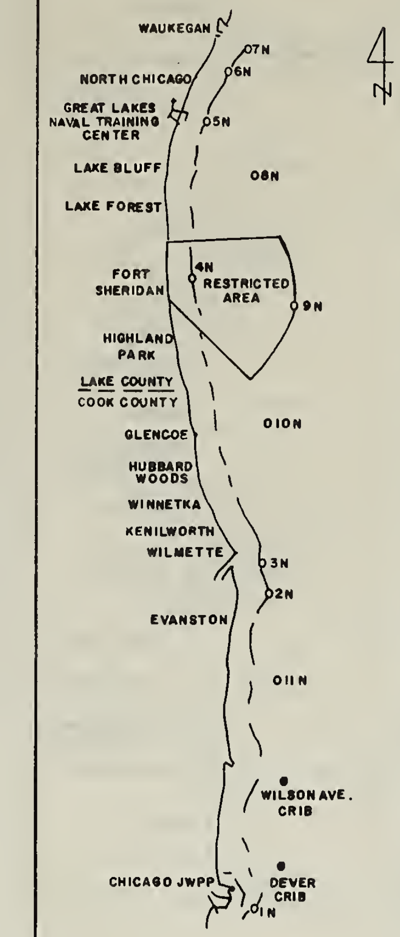
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

NORTH SHORE LAKE SURVEY

DATE Sept. 6, 19 78



PARAMETER		STORET NUMBER	SAMPLING POINT AND STATION NUMBER									
			1N CHW013	2N CHW011	3N CHW010	5N CHW005	6N CHW004	7N CHW003	8N CHW006	9N CHW008	10N CHW009	11N CHW012
TIME			0845	0944	0951	1113	1120	1128	1055	1032	1013	0926
TEMPERATURE	°C	00010	17	18	18	16	16	15	17	17	17	18
TURBIDITY	F.T.U.	00076	1.3	0.55	0.95	0.50	0.55	1.5	0.60	0.50	0.45	0.65
ODOR, THRESHOLD		00086	3Df	20M	20M	1M	2M	1M	1M	1M	1M	1M
pH		00400	8.3	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
SULFATE	mg/l	00945	23.0	22.5	22.5	22.5	22.5	22.5	23.3	23.0	23.5	23.2
CHLORIDE	mg/l	00940	9.0	8.6	8.6	8.6	8.8	8.4	8.6	8.8	8.6	8.6
PHOSPHATE, TOTAL	mg/l	00650	0.02	0.02	0.02	<0.01	0.04	0.01	0.01	0.01	<0.01	<0.01
PHOSPHATE, DISSOLVED	mg/l	00653	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
CONDUCTIVITY	μ mhos	00095	280	280	290	290	280	290	280	290	290	285
RESIDUE, NONFILTRABLE	mg/l	00530	9	4	3	5	3	4	7	7	3	5
OXYGEN DEMAND, CHEMICAL	mg/l	00335	16.7	8.9	8.9	8.9	4.9	7.9	6.9	4.9	8.9	9.8
NITROGEN, AMMONIA	mg/l	00610	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
NITROGEN, NITRITE-NITRATE	mg/l	00630	0.19	0.19	0.19	0.19	0.18	0.19	0.19	0.17	0.18	0.18
NITROGEN, ORGANIC	mg/l	00605	0.13	0.15	0.14	0.14	0.05	0.11	0.10	0.13	0.16	0.21
PHENOL-LIKE SUBSTANCES	μg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48 hr., 35 °C PER ml.		31753	69	10	20	18	5	2	2	5	3	14
MF-TC PER 100 ml.		31503	6	0	0	0	0	0	6	0	0	0
MF-FC PER 100 ml.		31616	2	0	4	0	0	0	0	0	0	0
MF-FS PER 100 ml.		31679	0	0	0	0	0	0	0	0	0	0
PLANKTON PER ml.		60050	20	20	40	20	220	820	0	20	0	20
ACTINOS 14 DAY, 26°C PER ml.		80148	0	0	0	0	0	0	0	0	0	0
FUNGI PER ml.		31856	0	1	0	0	0	0	0	0	1	0

METEOROLOGICAL DATA								PREVAILING WIND
TIME		0800	0900	1000	1100			00036
DIRECTION	00036	SW	SW	SW	SW			SW
VELOCITY	00035	11	10	8	7			

SURVEY BY: J. Esposito & G. Slowik

REMARKS:

TABLE 18

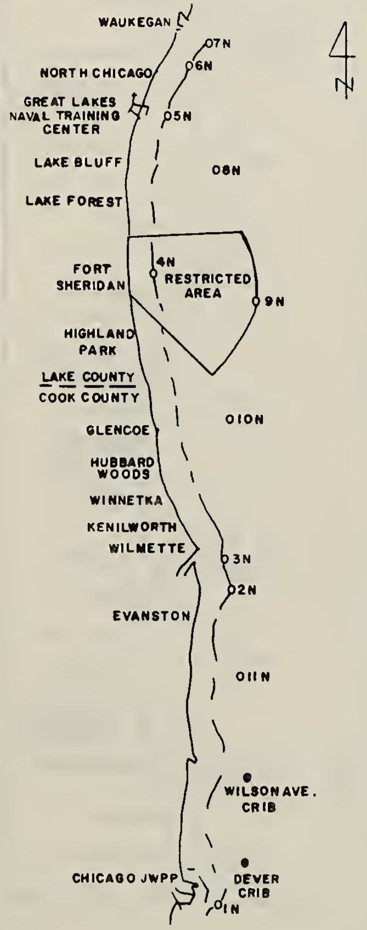
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

NORTH SHORE LAKE SURVEY

DATE Oct. 19, ,19 78



PARAMETER		STORET NUMBER	SAMPLING POINT AND STATION NUMBER									
			1N CHW013	2N CHW011	3N CHW010	5N CHW005	6N CHW004	7N CHW003	8N CHW006	9N CHW008	10N CHW009	11N CHW012
TIME			0848	0944	0953	1114	1121	1128	1057	1034	1015	0926
TEMPERATURE	°C	00010	13	12	12	11	11	11	12	12	13	12
TURBIDITY	F.T.U.	00076	3.0	1.7	0.95	0.70	0.95	1.3	0.70	0.50	0.60	1.5
ODOR, THRESHOLD		00086	20M	2M	1M	1M	1M	1M	1M	1M	1M	1M
pH		00400	8.4	8.4	8.4	8.4	8.3	8.3	8.3	8.4	8.4	8.4
SULFATE	mg/l	00945	22.0	21.5	21.5	22.0	22.5	22.0	23.5	23.0	22.5	23.0
CHLORIDE	mg/l	00940	9.4	9.7	10.0	9.4	9.6	9.6	9.2	9.2	9.2	9.4
PHOSPHATE, TOTAL	mg/l	00650	0.02	0.01	0.02	0.01	0.02	0.01	0.01	0.02	0.02	0.02
PHOSPHATE, DISSOLVED	mg/l	00653	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CONDUCTIVITY	µ mhos	00095	280	290	285	290	285	290	290	290	280	285
RESIDUE, NONFILTRABLE	mg/l	00530	5	6	2	6	1	5	3	3	1	6
OXYGEN DEMAND, CHEMICAL	mg/l	00335	10.8	6.9	3.9	8.8	8.8	3.9	2.9	6.9	6.9	6.9
NITROGEN, AMMONIA	mg/l	00610	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE	mg/l	00630	0.20	0.20	0.19	0.21	0.20	0.22	0.22	0.23	0.21	0.20
NITROGEN, ORGANIC	mg/l	00605	0.13	0.08	0.10	0.10	0.10	0.10	0.23	0.14	0.08	0.22
PHENOL-LIKE SUBSTANCES	µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48 hr., 35°C PER ml.		31753	32	18	22	25	18	12	15	19	38	52
MF-TC PER 100ml.		31503	12	4	6	0	4	0	2	0	0	8
MF-FC PER 100ml.		31616	6	2	0	0	2	0	0	0	0	0
MF-FS PER 100ml.		31679	0	0	0	0	0	0	0	0	0	0
PLANKTON PER ml.		60050	1680	2000	2140	220	320	40	40	120	360	1280
ACTINOS 14 DAY, 26°C PER ml.		80148	0	0	0	0	0	0	0	0	1	0
FUNGI PER ml		31856	1	0	0	0	0	1	0	0	0	0

METEOROLOGICAL DATA								PREVAILING WIND
TIME		0800	0900	1000	1100	1200		00036
DIRECTION	00036	W	W	W	W			W
VELOCITY	00035	6	5	3	11			

SURVEY BY J.E. / G.S.

REMARKS

TABLE 19

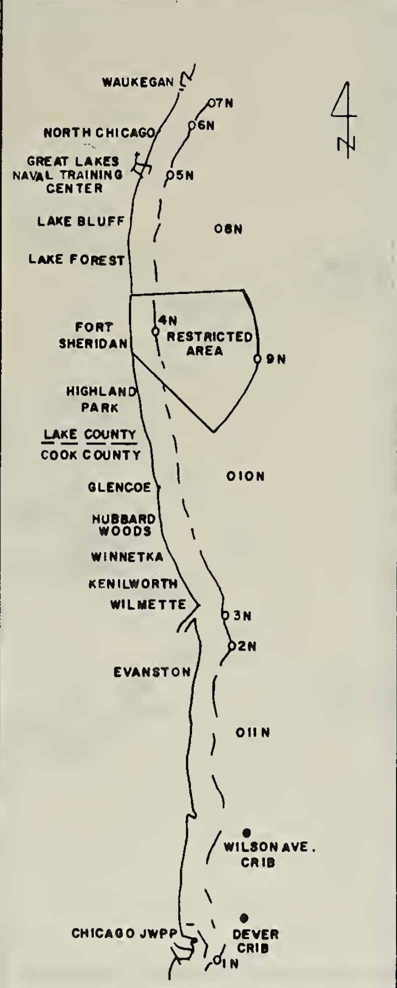
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

NORTH SHORE LAKE SURVEY

DATE Nov. 14 ,19 78



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER									
		1N CHW013	2N CHW011	3N CHW010	5N CHW005	6N CHW004	7N CHW003	8N CHW006	9N CHW008	10N CHW009	11N CHW012
TIME		0842	0943	0955	1115	1122	1128	1059	1036	1017	0924
TEMPERATURE °C	00010	10	10	9	8	8	8	9	9	9	10
TURBIDITY F.T.U.	00076	4.3	1.8	1.0	1.7	1.8	2.6	1.3	0.80	0.95	2.5
ODOR, THRESHOLD	00086	1M	1M	1M	1M	1M	1M	2M	1M	1M	1M
pH	00400	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2	8.3	8.3
SULFATE mg/l	00945	20.0	20.0	20.0	20.0	20.5	20.0	20.0	21.0	21.5	24.5
CHLORIDE mg/l	00940	7.4	7.2	7.2	7.6	7.4	7.4	7.4	7.4	7.8	7.8
PHOSPHATE, TOTAL mg/l	00650	0.05	0.05	0.04	0.05	0.04	0.05	0.05	<0.01	0.04	0.06
PHOSPHATE, DISSOLVED mg/l	00653	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.03
CONDUCTIVITY µ mhos	00095	275	290	290	290	290	290	290	285	290	290
RESIDUE, NONFILTRABLE mg/l	00530	6	1	1	1	2	1	5	3	2	3
OXYGEN DEMAND, CHEMICAL mg/l	00335	4.9	8.8	5.9	3.9	5.9	4.9	7.8	5.9	9.8	12.7
NITROGEN, AMMONIA mg/l	00610	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.22	0.23	0.20	0.22	0.22	0.22	0.21	0.20	0.23	0.24
NITROGEN, ORGANIC mg/l	00605	0.08	0.10	0.12	0.03	0.10	0.08	0.08	0.09	0.08	0.04
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48 hr., 35 °C PER ml.	31753	550	45	30	48	40	120	20	8	30	55
MF-TC PER 100 ml.	31503	40	24	18	22	22	86	12	4	18	42
MF-FC PER 100 ml.	31616	16	0	18	0	0	0	0	2	0	2
MF-FS PER 100 ml.	31679	6	-	0	0	-	0	-	0	-	0
PLANKTON PER ml.	60050	320	220	860	480	160	220	180	480	320	280
ACTINOS 14 DAY, 26°C PER ml.	80148	0	0	0	1	2	0	1	0	0	0
FUNGI PER ml.	31856	1	1	1	1	1	1	2	1	0	0

METEOROLOGICAL DATA									PREVAILING WIND
TIME		0800	0900	1000	1100				00036
DIRECTION	00036	W	W	W	W				W
VELOCITY	00035	11	12	11	10				

SURVEY BY J. Esposito & G. Slowik

REMARKS

TABLE 20

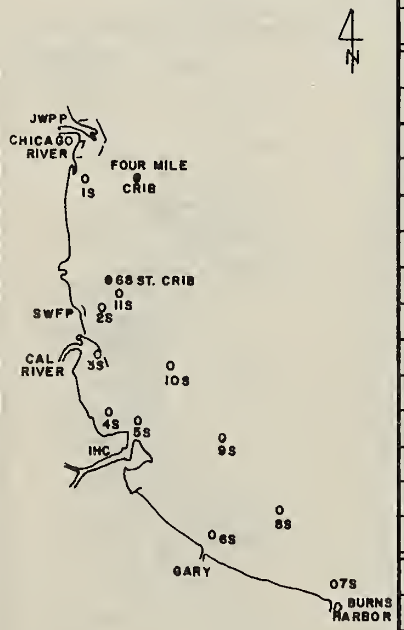
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

SOUTH SHORE LAKE SURVEY

DATE April 11, 1978



PARAMETER		STORET NUMBER	SAMPLING POINT AND STATION NUMBER										
			1S	2S	3S	4S	5S	6S	7S	8S	9S	10S	11S
			CHW014	CHW015	CHW017	CHW019	CHW020	CHW021	CHW024	CHW023	CHW022	CHW018	CHW016
TIME			0850	0925	0937	0953	1001	1035	1106	1129	1152	1215	1238
TEMPERATURE	°C	00010	6	6	8	7.5	6.5	5	4	4	5.5	5	5.5
TURBIDITY	F.T.U.	00076	3.8	2.5	2.9	2.7	2.3	2.9	2.9	1.6	2.2	2.1	2.1
ODOR, THRESHOLD		00086	IM	IM	IM	2M	IM	IM	IM	IM	IM	IM	2M
pH		00400	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
SULFATE	mg/l	00945	22.9	21.0	25.7	24.5	22.2	22.0	22.7	23.0	21.0	19.3	18.8
CHLORIDE	mg/l	00940	10.0	9.9	10.8	11.0	10.5	10.5	10.8	10.5	10.0	10.0	10.5
PHOSPHATE, TOTAL	mg/l	00650	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.02	0.01	<0.01	<0.01	0.04
PHOSPHATE, DISSOLVED	mg/l	00653	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CONDUCTIVITY	μ mhos	00095	295	295	325	325	310	305	310	310	305	295	295
RESIDUE, NONFILTRABLE	mg/l	00530	7	7	3	8	4	1	2	5	1	0	1
OXYGEN DEMAND, CHEMICAL	mg/l	00335	17.2	11.1	15.2	16.2	15.2	20.2	13.1	14.1	22.2	10.1	14.1
NITROGEN, AMMONIA	mg/l	00610	0.01	0.01	0.08	0.18	0.07	0.02	0.04	0.04	0.05	0.01	0.01
NITROGEN, NITRITE-NITRATE	mg/l	00630	0.17	0.18	0.24	0.24	0.19	0.23	0.28	0.24	0.19	0.18	0.16
NITROGEN, ORGANIC	mg/l	00605	0.12	0.12	0.20	0.24	0.12	0.20	0.08	0.08	0.08	0.08	0.12
PHENOL-LIKE SUBSTANCES	μg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48 hr., 35°C PER ml.			60	510	8400	22000	3000	2400	2200	640	970	390	25
MF-TC PER 100ml.		31503	0	0	116	1920	100	58	68	4	6	0	0
MF-FC PER 100ml.		31616	0	0	14	60	8	12	14	0	2	0	0
MF-FS PER 100ml.		31679	0	0	0	0	0	4	10	0	0	0	0
PLANKTON PER ml.		60050	600	80	1500	680	980	640	660	620	860	1320	700
ACTINOS 14 DAY, 26°C PER ml.			0	0	1	0	5	10	4	8	0	1	0
FUNGI PER ml.			1	0	1	0	0	5	3	4	1	0	0

METEOROLOGICAL DATA									PREVAILING WIND
TIME		0800	0900	1000	1100	1200	1300		00036
DIRECTION	00036	W	W	W	W	W	W		W
VELOCITY	00035	9	13	12	12	14	14		

SURVEY BY: M. Kniahynycky, J. Esposito

REMARKS:

TABLE 21

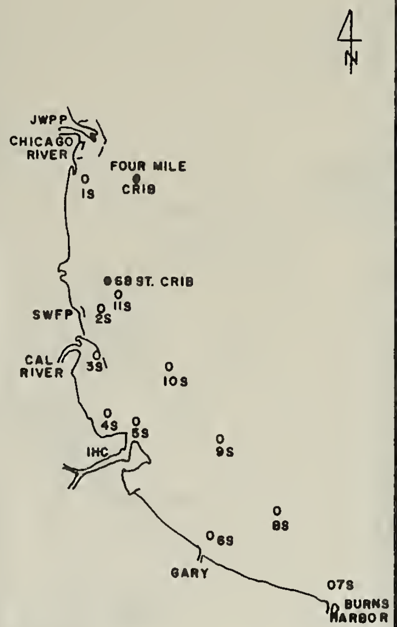
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

SOUTH SHORE LAKE SURVEY

DATE May 25, 1978



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER										
		1S	2S	3S	4S	5S	6S	7S	8S	9S	10S	11S
		CHW014	CHW015	CHW017	CHW019	CHW020	CHW021	CHW024	CHW023	CHW022	CHW018	CHW016
TIME		0855	0930	0945	1002	1009	1048	1120	1142	1205	1227	1250
TEMPERATURE °C	00010	12	13	13	14	15	13	13	12	11	15	13
TURBIDITY F.T.U.	00076	1.3	1.3	2.3	1.7	2.2	1.4	1.5	0.50	0.75	1.7	1.2
ODOR, THRESHOLD	00086	2MG	1M	1M	3Ch	2Ch	2Df	2M	1M	1M	2Ch	1M
pH	00400	8.4	8.4	8.4	8.4	8.2	8.4	8.4	8.4	8.4	8.4	8.4
SULFATE mg/l	00945	21.5	21.5	23.0	27.5	37.5	24.5	30.5	20.5	21.5	31.5	22.0
CHLORIDE mg/l	00940	11.1	11.1	11.5	14.5	18.0	11.8	14.1	10.5	10.5	15.2	11.0
PHOSPHATE, TOTAL mg/l	00650	0.06	0.03	0.06	0.06	0.06	0.06	0.07	0.06	0.21	0.12	0.06
PHOSPHATE, DISSOLVED mg/l	00653	<0.01	<0.01	<0.01	<0.01	0.02	0.02	<0.01	0.03	0.12	0.02	0.01
CONDUCTIVITY µ mhos	00095	290	285	295	305	345	300	315	285	285	315	285
RESIDUE, NONFILTRABLE mg/l	00530	9	17	19	12	9	13	16	7	11	9	13
OXYGEN DEMAND, CHEMICAL mg/l	00335	5.9	4.9	5.9	6.9	22.5	12.7	12.7	16.7	4.9	9.8	7.8
NITROGEN, AMMONIA mg/l	00610	0.01	0.01	0.03	0.05	0.40	0.03	0.03	0.01	0.01	0.20	0.01
NITROGEN, NITRITE-NITRATE mg/l *	00630											
NITROGEN, ORGANIC mg/l	00605	0.08	0.12	0.12	0.16	0.12	0.12	0.12	0.20	0.12	0.24	0.16
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	3	<1	1	1	1	1	<1	<1	<1	<1
PLATE COUNT 48 hr., 35°C PER ml.	31753	25	15	22000	27000	27000	25	3200	1	5	9000	5
MF-TC PER 100ml.	31503	0	0	8	25000	2800	0	328	0	2	0	20
MF-FC PER 100ml.	31616	0	0	0	170	156	0	26	0	0	0	0
MF-FS PER 100ml.	31679	0	0	0	0	4	0	0	0	2	0	0
PLANKTON PER ml.	60050	400	220	260	360	440	440	800	520	760	1160	600
ACTINOS 14 DAY, 26°C PER ml.	80148	1	4	0	2	2	0	0	1	1	0	0
FUNGI PER ml.	31856	0	0	1	2	0	0	2	0	0	0	0

METEOROLOGICAL DATA									PREVAILING WIND
TIME		0800	0900	1000	1100	1200	1300		00036
DIRECTION	00036	SE	SE	E	E	E	E		E
VELOCITY	00038	3	1	2	3	4	5		

SURVEY BY: M. Kniahynycky & G. Slowik

REMARKS:

* Not done - Technical difficulties with Auto Analyzer II

TABLE 22

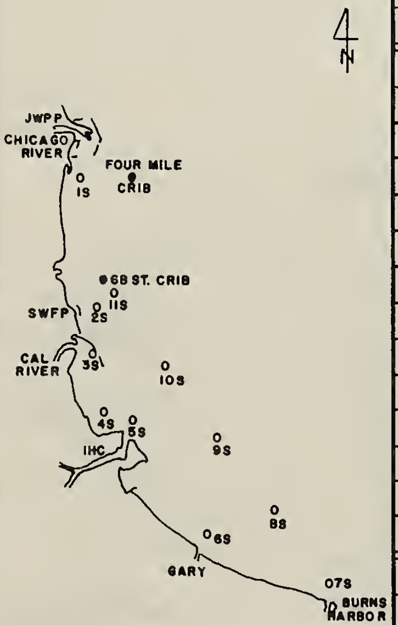
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

SOUTH SHORE LAKE SURVEY

DATE July 11, 1978



PARAMETER		STORET NUMBER	SAMPLING POINT AND STATION NUMBER										
			1S CHW014	2S CHW015	3S CHW017	4S CHW019	5S CHW020	6S CHW021	7S CHW024	8S CHW023	9S CHW022	10S CHW018	11S CHW016
TIME			0800	1008	1020	1038	1048	1127	1155	1218	1241	1304	1327
TEMPERATURE	°C	00010	17	17	17	17	18	16	18	17	17	17	18
TURBIDITY	F.T.U.	00076	0.65	0.55	0.60	0.80	2.4	0.45	0.70	0.65	0.40	0.40	0.40
ODOR, THRESHOLD		00086	2M	1M	2M	2M	5Ch	3DMG	2M	2M	2M	1M	1M
pH		00400	8.5	8.5	8.5	8.5	8.5	8.2	8.5	8.5	8.5	8.5	8.5
SULFATE	mg/l	00945	23.5	22.0	23.5	24.0	33.2	23.5	24.0	24.4	23.5	23.5	23.0
CHLORIDE	mg/l	00940	9.6	9.4	9.0	9.0	14.5	8.2	8.8	9.0	9.0	8.6	8.6
PHOSPHATE, TOTAL	mg/l	00650	0.03	0.02	0.01	0.02	0.02	0.02	0.01	0.02	<0.01	<0.01	0.01
PHOSPHATE, DISSOLVED	mg/l	00653	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CONDUCTIVITY	µ mhos	00095	295	300	295	300	355	295	300	300	290	295	295
RESIDUE, NONFILTRABLE	mg/l	00530	5	2	1	7	3	1	7	1	1	3	4
OXYGEN DEMAND, CHEMICAL	mg/l	00335	12.7	9.8	10.8	10.8	29.4	10.8	4.9	9.8	9.8	11.8	8.8
NITROGEN, AMMONIA	mg/l	00610	0.01	0.01	0.01	0.01	0.40	0.01	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE	mg/l	00630	0.26	0.29	0.26	0.25	0.32	0.26	0.26	0.26	0.25	0.25	0.25
NITROGEN, ORGANIC	mg/l	00605	0.04	0.04	0.03	0.04	0.05	0.05	0.06	0.04	0.07	0.02	0.02
PHENOL-LIKE SUBSTANCES	µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48 hr., 35°C PER ml.		31753	66	52	170	840	39000	32	1300	580	72	25	16
MF-TC PER 100ml.		31503	0	0	14	1300	7000	0	8	2	0	0	2
MF-FC PER 100ml.		31616	0	0	0	0	336	0	0	0	0	0	0
MF-FS PER 100ml.		31679	0	0	0	0	2	0	0	0	0	0	0
PLANKTON PER ml.		60050	2060	580	360	980	1140	2300	2500	NR	60	NR	600
ACTINOS 14 DAY, 26°C PER ml.		80148	1	0	2	0	0	1	1	0	0	1	0
FUNGI PER ml.		31856	0	0	1	1	0	1	2	0	0	2	1

METEOROLOGICAL DATA									PREVAILING WIND
TIME		0800	0900	1000	1100	1200	1300	1400	00036
DIRECTION	00036	NE	NE	E	E	E	E	E	E
VELOCITY	00035	4	6	5	5	7	7	7	

SURVEY BY: J. Esposito & G. Slowik

REMARKS:

TABLE 23

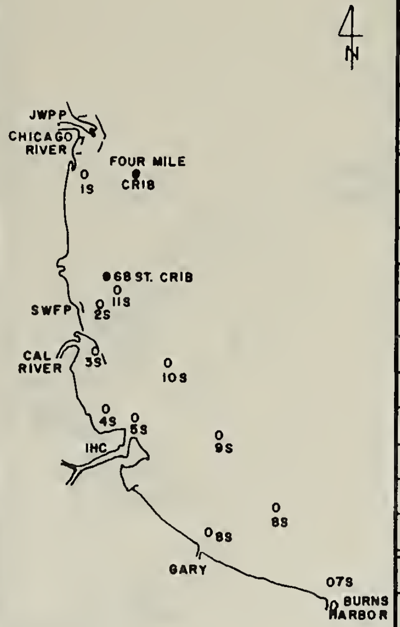
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

SOUTH SHORE LAKE SURVEY

DATE August 1, 19 78



PARAMETER	STORET NUMBER	1S CHW014	2S CHW015	3S CHW017	4S CHW019	5S CHW020	6S CHW021	7S CHW024	8S CHW023	9S CHW022	10S CHW018	11S CHW016
		SAMPLING POINT AND STATION NUMBER										
TIME		0855	0928	0940	0955	1008	1044	1113	1136	1202	1225	1248
TEMPERATURE °C	00010	17	17	17	17	17	18	18	18	18	18	18
TURBIDITY FTU	00076	0.50	0.60	0.75	0.95	0.95	0.60	0.50	0.40	0.40	0.55	0.40
ODOR, THRESHOLD	00086	2M	1M	1M	2M	2M	1M	1M	1M	1M	1M	1M
pH	00400	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
SULFATE mg/l	00945	20.0	21.0	21.0	21.5	21.4	20.0	20.5	21.0	20.3	20.5	20.3
CHLORIDE mg/l	00940	9.0	9.4	10.0	9.7	9.4	9.4	9.6	9.5	9.7	10.1	9.6
PHOSPHATE, TOTAL mg/l	00650	0.01	<0.01	0.01	<0.01	<0.01	0.03	<0.01	0.01	0.01	0.01	<0.01
PHOSPHATE, DISSOLVED mg/l	00653	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01
CONDUCTIVITY µ mhos	00095	295	295	295	295	300	290	290	290	290	290	295
RESIDUE, NONFILTRABLE mg/l	00530	1	1	1	1	1	3	3	5	7	2	2
OXYGEN DEMAND, CHEMICAL mg/l	00335	6.9	8.9	6.9	6.9	6.9	8.9	8.9	6.9	7.9	7.9	7.9
NITROGEN, AMMONIA mg/l	00610	0.01	0.02	0.02	0.02	0.02	0.03	0.01	0.01	0.01	0.01	0.02
NITROGEN, NITRITE-NITRATE mg/l	00630	0.22	0.22	0.23	0.23	0.24	0.22	0.22	0.22	0.23	0.21	0.21
NITROGEN, ORGANIC mg/l	00605	0.12	0.12	0.16	0.16	0.16	0.16	0.16	0.16	0.12	0.16	0.12
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48 hr., 35°C PER ml.	31753	63	240	230	490	2700	69	27	7	9	36	16
MF-TC PER 100ml.	31503	2	8	24	52	142	8	2	4	0	4	0
MF-FC PER 100ml.	31616	0	0	0	8	32	0	0	0	0	0	0
MF-FS PER 100ml.	31679	0	0	0	0	0	0	0	0	0	0	0
PLANKTON PER ml.	60050	780	220	380	980	60	200	600	20	120	460	280
ACTINOS 14 DAY, 26°C PER ml.	80148	2	1	0	2	9	2	1	1	0	1	0
FUNGI PER ml.	31856	1	1	1	0	0	1	0	0	0	0	0

METEOROLOGICAL DATA

									PREVAILING WIND
TIME		0800	0900	1000	1100	1200			00036
DIRECTION	00036	NW	NW	NW	NW	NE			N
VELOCITY	00038	5	5	3	2	2			

SURVEY BY: J. Esposito & J. Shadle

REMARKS:

TABLE 24

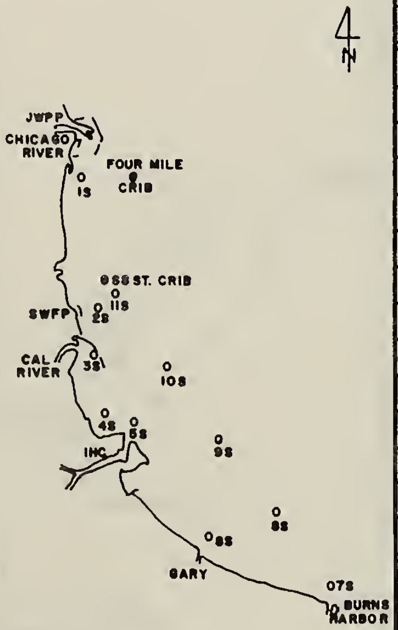
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

SOUTH SHORE LAKE SURVEY

DATE August 22, 19 78



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER										
		1S CHW014	2S CHW015	3S CHW017	4S CHW019	5S CHW020	6S CHW021	7S CHW024	8S CHW023	9S CHW022	10S CHW018	11S CHW016
TIME		0856	0931	0940	0957	1008	1046	1116	1139	1202	1225	1248
TEMPERATURE °C	00010	16	14	14	16	15	17	18	21	21	17	16
TURBIDITY F.T.U.	00076	0.75	0.95	1.4	0.85	0.80	0.85	0.80	0.60	0.35	1.4	0.80
ODOR, THRESHOLD	00086	1M	1M	2M	1M	1M	1M	1M	1M	1M	2Cn	1M
pH	00400	8.3	8.3	8.3	8.3	8.4	8.4	8.4	8.5	8.6	8.3	8.4
SULFATE mg/l	00945	20.2	23.1	23.0	23.0	22.5	23.3	24.0	22.5	21.8	26.1	22.7
CHLORIDE mg/l	00940	9.4	9.2	10.0	10.0	10.0	9.8	10.4	9.8	10.0	12.4	10.0
PHOSPHATE, TOTAL mg/l	00650	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01
PHOSPHATE, DISSOLVED mg/l	00653	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CONDUCTIVITY µ mhos	00095	290	300	300	290	295	295	300	290	290	320	295
RESIDUE, NONFILTRABLE mg/l	00530	1	4	2	1	1	4	2	1	3	3	4
OXYGEN DEMAND, CHEMICAL mg/l	00335	7.9	12.9	8.9	10.9	9.9	5.9	8.9	2.0	6.9	10.9	5.9
NITROGEN, AMMONIA mg/l	00610	0.01	0.03	0.02	0.02	0.02	0.02	0.03	0.01	0.01	0.20	0.02
NITROGEN, NITRITE-NITRATE mg/l	00630	0.20	0.20	0.19	0.18	0.17	0.16	0.17	0.12	0.12	0.20	0.21
NITROGEN, ORGANIC mg/l	00605	0.12	0.12	0.12	0.20	0.12	0.08	0.12	0.08	0.08	0.08	0.08
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48 hr., 35°C PER ml.	31753	28	240	730	860	360	60	730	15	13	10000	150
MF-TC PER 100ml.	31503	6	140	108	172	164	62	142	158	0	8000	12
MF-FC PER 100ml.	31616	0	2	0	4	2	2	6	0	0	172	0
MF-FS PER 100ml.	31679	2	0	0	0	0	0	2	0	0	0	0
PLANKTON PER ml.	60050	200	860	680	220	1020	500	600	420	220	800	
ACTINOS 14 DAY, 26°C PER ml.	80148	0	0	0	2	0	0	1	1	0	0	0
FUNGI PER ml.	31856	4	0	0	0	0	0	0	0	0	0	0

METEOROLOGICAL DATA									PREVAILING WIND
TIME		0800	0900	1000	1100	1200			00036
DIRECTION	00036	SE	NW	SW	W	W			W
VELOCITY	00035	5	6	12	8	13			

SURVEY BY: J. Esposito & G. Slowik

REMARKS:

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TABLE 25

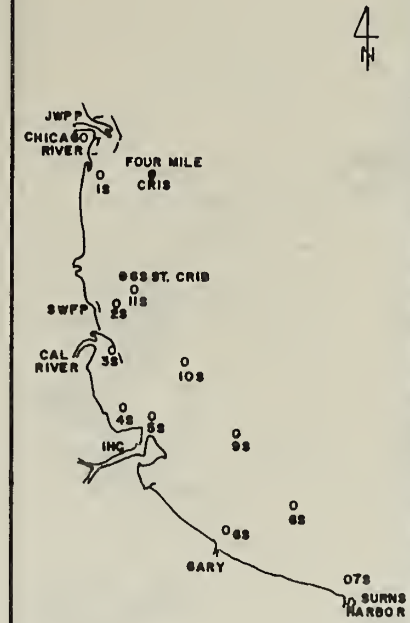
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

SOUTH SHORE LAKE SURVEY

DATE Sept. 12, 19 78



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER										
		1S	2S	3S	4S	5S	6S	7S	8S	9S	10S	11S
		CHW014	CHW015	CHW017	CHW019	CHW020	CHW021	CHW024	CHW023	CHW022	CHW018	CHW016
TIME		0943	1020	1029	1045	1055	1131		1149	1212	1235	1258
TEMPERATURE °C	00010	17	21	19	19	19	23		23	22	21	22
TURBIDITY F.T.U.	00076	0.60	0.55	1.5	0.80	0.85	0.80		0.90	0.70	0.60	0.50
ODOR, THRESHOLD	00086	2M	1M	1M	1M	1M	3DM		1M	1M	1M	1M
pH	00400	8.4	8.4	8.2	8.4	8.4	8.5		8.5	8.5	8.4	8.4
SULFATE mg/l	00945	23.0	22.8	25.0	23.0	22.2	23.0		22.0	22.5	23.3	22.3
CHLORIDE mg/l	00940	9.0	8.2	9.8	10.2	8.8	8.6		9.6	8.0	8.4	8.6
PHOSPHATE, TOTAL mg/l	00650	0.01	0.01	0.02	0.02	0.02	0.02		0.01	<0.01	0.01	0.02
PHOSPHATE, DISSOLVED mg/l	00653	<0.01	<0.01	0.01	0.01	0.01	0.01		<0.01	<0.01	<0.01	0.01
CONDUCTIVITY µ mhos	00095	275	285	295	295	295	290		280	285	300	290
RESIDUE, NONFILTRABLE mg/l	00530	7	1	2	4	6	1		5	1	2	1
OXYGEN DEMAND, CHEMICAL mg/l	00335	6.9	5.9	7.9	6.9	5.0	6.9		6.9	7.9	5.0	2.0
NITROGEN, AMMONIA mg/l	00610	0.01	0.02	0.02	0.01	0.02	0.01		0.01	0.02	0.03	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.19	0.18	0.19	0.19	0.18	0.16		0.14	0.16	0.18	0.17
NITROGEN, ORGANIC mg/l	00605	0.13	0.13	0.13	0.13	0.13	0.13		0.10	0.13	0.13	0.13
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1
PLATE COUNT 48 hr., 35°C PER ml.	31753	44	170	1800	4100	2100	180		44	120	2100	10
MF-TC PER 100ml.	31503	180	164	160	76	72	452		112	104	830	24
MF-FC PER 100ml.	31616	2	16	104	252	108	0		0	0	84	0
MF-FS PER 100ml.	31679	0	0	2	0	0	0		0	0	0	0
PLANKTON PER ml.	60050	180	120	420	240	100	120		80	200	200	140
ACTINOS 14 DAY, 26°C PER ml.	80148	0	0	5	5	6	1		0	0	7	0
FUNGI PER ml.	31856	0	1	0	0	0	0		0	1	0	0

METEOROLOGICAL DATA									PREVAILING WIND
TIME		0800	0900	1000	1100	1200	1232		00036
DIRECTION	00036	E	E	SW	SW	SW	E		SW
VELOCITY	00038	1	2	4	5	3	4		

SURVEY BY: J. Esposito & G. Slowik

REMARKS: Point 7s not sampled. Early return due to tnreat of servere weather.

TABLE 26

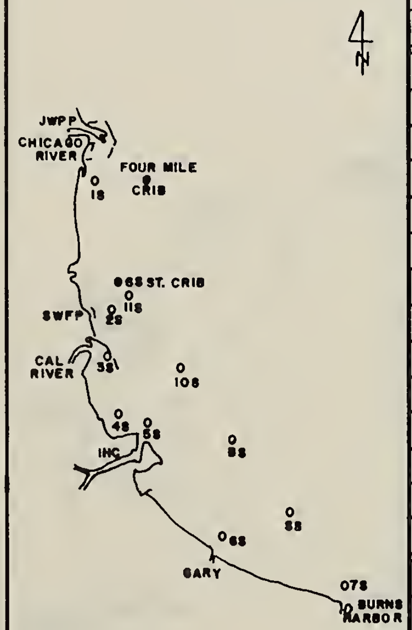
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

SOUTH SHORE LAKE SURVEY

DATE Nov. 2, 19 78



PARAMETER		STORET NUMBER	SAMPLING POINT AND STATION NUMBER										
			1S	2S	3S	4S	5S	6S	7S	8S	9S	10S	11S
			CHW014	CHW015	CHW017	CHW019	CHW020	CHW021	CHW024	CHW023	CHW022	CHW018	CHW016
TIME			0914	0946	0958	1016	1025	1100	1133	1156	1219	1242	1305
TEMPERATURE	°C	00010	12	12	12	12	12	12	12	12	13	13	12
TURBIDITY	F.T.U.	00076	1.3	1.3	1.6	1.3	1.4	1.3	1.3	0.85	0.65	0.80	1.0
ODOR, THRESHOLD		00086	1G	1M	1DM	1M	1M	1DM	1M	1M	1M	1DM	1M
pH		00400	8.2	8.2	8.2	8.2	8.2	8.3	8.3	8.3	8.3	8.3	8.3
SULFATE	mg/l	00945	22.5	22.5	23.0	23.5	24.0	23.0	22.5	22.0	22.5	23.0	23.0
CHLORIDE	mg/l	00940	8.4	8.6	9.0	9.0	9.6	9.8	9.4	9.6	8.8	9.4	9.0
PHOSPHATE, TOTAL	mg/l	00650	0.01	0.01	0.05	0.03	0.03	0.02	0.01	0.01	0.02	0.01	0.02
PHOSPHATE, DISSOLVED	mg/l	00653	<0.01	<0.01	<0.01	0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01	0.01
CONDUCTIVITY	µ mhos	00095	280	290	300	300	305	305	305	305	305	300	290
RESIDUE, NONFILTRABLE	mg/l	00530	5	6	2	1	4	3	2	5	4	5	3
OXYGEN DEMAND, CHEMICAL	mg/l	00335	17.0	18.0	1.0	8.0	15.0	18.0	16.0	8.0	6.0	5.0	9.0
NITROGEN, AMMONIA	mg/l	00610	0.01	0.02	0.02	0.02	0.04	0.01	0.02	0.01	0.02	0.01	0.01
NITROGEN, NITRITE-NITRATE	mg/l	00630	0.29	0.25	0.30	0.25	0.25	0.29	0.30	0.30	0.26	0.27	0.24
NITROGEN, ORGANIC	mg/l	00605	0.16	0.08	0.16	0.12	0.12	0.20	0.20	0.20	0.12	0.20	0.12
PHENOL-LIKE SUBSTANCES	µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48 hr., 35°C PER ml.		31753	18	83	410	160	1100	1200	2800	34	24	62	110
MF-TC PER 100ml.		31503	2	80	130	156	172	182	36	10	0	14	102
MF-FC PER 100ml.		31616	0	42	74	68	64	40	0	6	0	0	56
MF-FS PER 100ml.		31679	0	6	2	0	0	0	0	0	0	0	0
PLANKTON PER ml.		60050	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
ACTINOS 14 DAY, 26°C PER ml.		80148	0	0	0	0	0	0	1	0	0	0	0
FUNGI PER ml.		31856	0	0	0	1	0	0	0	0	0	0	0

METEOROLOGICAL DATA								PREVAILING WIND
TIME		0800	0900	1000	1100	1200	1300	00036
DIRECTION	00036	W	W	W	W	W	SW	W
VELOCITY	00038	7	8	7	8	6	7	

SURVEY BY: J. Esposito / E. Evangelista

REMARKS:

TABLE 27

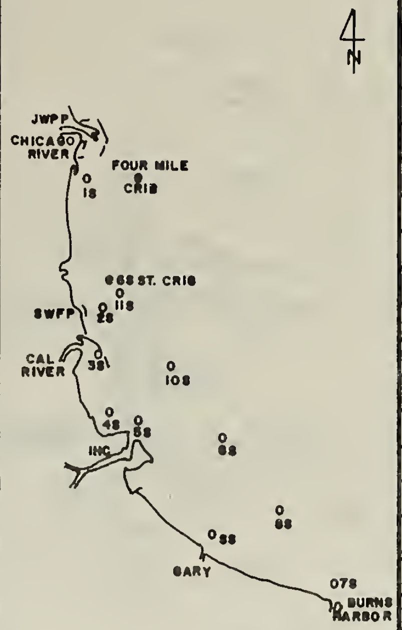
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

SOUTH SHORE LAKE SURVEY

DATE DEC. 14, 19 78



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER										
		1S CHW014	2S CHW015	3S CHW017	4S CHW019	5S CHW020	6S CHW021	7S CHW024	8S CHW023	9S CHW022	10S CHW018	11S CHW016
TIME		0855	0932	0951	1010	1019	1052	1122	1146	1209	1232	1255
TEMPERATURE °C	00010	2	1	1	1	1	1	2	1	1	1	1
TURBIDITY F.T.U.	00076	2.6	1.6	3.6	3.3	2.8	1.3	1.3	2.4	2.6	1.3	2.1
ODOR, THRESHOLD	00086	2M	1M	1M	2M	2M	1M	1M	30M	1M	10m	1M
pH	00400	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
SULFATE mg/l	00945	23.0	23.5	25.5	23.0	25.5	22.8	22.8	27.0	27.4	23.0	24.0
CHLORIDE mg/l	00940	8.6	9.4	9.2	8.6	9.6	8.6	8.4	9.8	9.6	8.4	8.4
PHOSPHATE, TOTAL mg/l	00650	0.01	0.01	0.04	0.03	<0.01	0.02	0.02	0.04	0.02	<0.01	0.02
PHOSPHATE, DISSOLVED mg/l	00653	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CONDUCTIVITY µ mhos	00095	310	310	305	305	305	310	300	315	310	295	305
RESIDUE, NONFILTRABLE mg/l	00530	6	1	15	8	5	6	18	5	5	3	10
OXYGEN DEMAND, CHEMICAL mg/l	00335	7.0	8.0	11.0	7.0	11.0	4.0	6.0	9.0	7.0	8.0	13.0
NITROGEN, AMMONIA mg/l	00610	<0.01	<0.01	0.02	0.01	0.07	0.01	<0.01	0.07	0.06	0.02	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.25	0.25	0.24	0.26	0.25	0.23	0.23	0.22	0.24	0.24	0.25
NITROGEN, ORGANIC mg/l	00605	0.16	0.16	0.20	0.24	0.20	0.20	0.20	0.24	0.20	0.16	0.24
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48 hr., 35°C PER ml.	31753	120	6	1200	140	3600	46	45	1900	14	1800	8
MF-TC PER 100ml.	31503	0	0	652	80	0	0	36	504	392	0	0
MF-FC PER 100ml.	31616	0	0	168	0	0	0	16	240	228	0	0
MF-FS PER 100ml.	31679	2	0	18	0	0	0	0	0	0	0	0
PLANKTON PER ml.	60050	460	2000	1040	1340	1380	1580	2460	1780	3260	360	760
ACTINOS 14 DAY, 26°C PER ml.	80148	0	0	0	1	1	2	1	0	1	1	0
FUNGI PER ml.	31856	1	0	1	2	0	0	0	2	1	0	0

METEOROLOGICAL DATA									PREVAILING WIND
TIME		0800	0900	1000	1100	1200	1300		00036
DIRECTION	00036	SW	SW	SW	SW	SW	SW		SW
VELOCITY	00035	10	14	14	15	12	13		

SURVEY BY: J. Esposito & G. Slowik

REMARKS:

TABLE 28

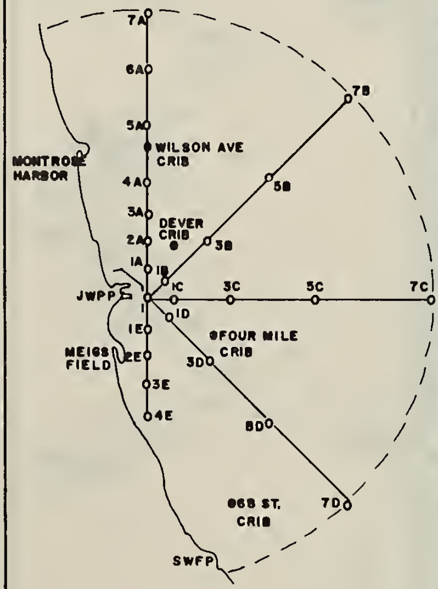
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

J.W.P.P. RADIAL LAKE SURVEY

DATE March 28, ,19 78



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER																						
		1A CHW052	2A CHW047	3A CHW042	4A CHW037	5A CHW033	6A CHW029	7A CHW025	1B CHW053	3B CHW043	5B CHW034	7B CHW026	1C CHW054	3C CWH044	5C CHW035	7C CHW027	1D CHW058	3D CHW045	5D CHW036	7D CHW028	1E CHW056	2E CHW051	3E CHW048	4E CHW041
TIME		0847	085	0856	0900	0909	0918	0927	1046	1037	1023	1005	1057	1106	1120	1138	1213	1231	1245	1254	1303	1308	1312	1317
TEMPERATURE °C	00010	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2
TURBIDITY F.T.U.	00076	3.2	2.2	1.5	1.5	2.0	1.6	1.6	0.45	0.45	0.30	0.35	1.5	0.45	0.25	0.30	1.0	0.55	0.40	0.55	3.0	2.3	1.8	1.1
ODOR, THRESHOLD	00086	1M	2M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	2M	1M	1M	1M	1M	1M	1M	1M
pH	00400	8.1	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
SULFATE mg/l	00945	22.3	23.7	23.6	26.0	25.8	25.0	25.2	24.3	25.0	25.0	25.5	26.5	25.0	25.0	25.3	26.1	26.0	25.0	25.8	26.6	27.3	27.3	27.3
CHLORIDE mg/l	00940	10.0	9.0	9.0	9.0	9.2	9.0	9.0	9.4	9.6	9.2	9.0	9.0	9.0	9.1	9.0	9.0	9.2	9.0	9.1	9.0	9.4	9.2	9.2
PHOSPHATE, TOTAL mg/l	00650	0.05	0.03	0.03	0.15	0.05	0.03	0.08	0.03	0.08	0.06	0.03	0.03	0.08	0.02	0.06	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03
PHOSPHATE, DISSOLVED mg/l	00653	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.06	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
CONDUCTIVITY μ mhos	00095	320	330	325	325	330	315	325	325	320	325	325	330	330	325	310	330	320	320	315	330	295	295	295
RESIDUE, NONFILTRABLE mg/l	00530	13	17	13	17	17	6	9	17	9	6	13	23	11	19	17	20	17	11	9	25	25	15	15
OXYGEN DEMAND, CHEMICAL mg/l	00335	10.0	8.0	6.0	7.0	6.0	5.0	6.0	4.0	5.0	4.0	16.0	6.0	7.0	6.0	4.0	8.0	7.0	8.0	6.0	10.0	9.0	6.0	8.0
NITROGEN, AMMONIA mg/l	00610	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NITROGEN, NITRITE-NITRATE mg/l	00630	0.21	0.27	0.30	0.30	0.28	0.26	0.28	0.29	0.28	0.27	0.28	0.29	0.29	0.22	0.27	0.29	0.27	0.26	0.26	0.29	0.27	0.32	0.32
NITROGEN ORGANIC mg/l	00605	0.08	0.08	0.00	0.08	0.08	0.08	0.08	0.04	0.04	0.12	0.08	0.08	0.20	0.20	0.20	0.24	0.24	0.24	0.20	0.20	0.20	0.20	0.20
IRON, TOTAL μg/l	01045	54	<10	62	62	80	62	50	16	12	10	12	52	10	10	10	40	10	12	16	125	62	54	52
PHENOL-LIKE SUBSTANCES μg/l	32730	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48hr., 35°C PER ml.		9	5	3	0	0	0	3	1	0	0	0	2	0	0	0	0	0	0	0	3	1	2	1
MF-TC PER 100 ml.	31503	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MF-FS PER 100 ml.	31679	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLANKTON PER ml.	60050	100		40		260		200	300	80	240	100	240	240	320	100	140	560	40	140	140		60	
ACTINOS 14 DAY, 26°C PER ml.		1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
FUNGI PER ml.		0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0

METEOROLOGICAL DATA									PREVAILING WINDS
TIME		0800	0900	1000	1100	1200	1300		00036
DIRECTION	00036	W	W	W	NW	NW	NW		W
VELOCITY	00035	10	6	8	6	3	2		

SURVEY BY: JE & GS

REMARKS:

TABLE 29

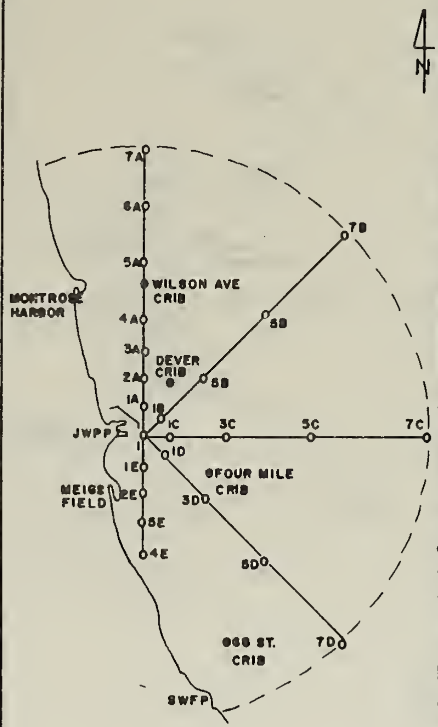
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

J.W.P.P. RADIAL LAKE SURVEY

DATE May 18, ,19 78



PARAMETER	STORET NUMBER	1A	2A	3A	4A	5A	6A	7A	1B	3B	5B	7B	1C	3C	5C	7C	1D	3D	5D	7D	1E	2E	3E	4E
		CHW052	CHW047	CHW042	CHW037	CHW033	CHW029	CHW025	CHW053	CHW043	CHW034	CHW026	CHW054	CWH044	CHW035	CHW027	CHW055	CHW045	CHW036	CHW028	CHW056	CHW051	CHW046	CHW041
TIME		0852	0857	0901	0906	0915	0924	0933	1053	1044	1030	1012	1103	1112	1126	1144	1249	1241	1232	1214	1300	1305	1309	1314
TEMPERATURE °C	00010	10	10	9	10	9	9	9	10	9	8	7	10	9	8	8	11	10	10	10	13	12	12	12
TURBIDITY F.T.U.	00076	2.7	2.1	1.9	2.3	1.8	1.5	1.3	1.5	0.95	0.65	0.45	1.6	0.60	0.45	0.45	2.2	0.70	0.60	0.65	5.4	6.7	6.0	1.8
ODOR, THRESHOLD	00086	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM	2M	IM
pH	00400	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
SULFATE mg/l	00945	24.5	25.0	23.5	21.6	21.1	22.1	22.6	21.6	21.6	21.6	21.1	21.6	22.6	22.1	21.6	23.5	22.1	21.1	19.7	24.0	25.4	25.0	23.0
CHLORIDE mg/l	00940	10.8	10.5	10.2	9.9	9.9	9.8	10.2	10.0	9.5	9.5	9.4	9.9	9.4	9.5	9.3	9.9	9.3	9.4	9.5	10.5	10.7	10.8	10.0
PHOSPHATE, TOTAL mg/l	00650	0.02	0.03	0.03	0.02	0.04	0.02	0.05	0.03	0.02	0.02	0.02	0.03	0.05	0.03	0.01	0.03	0.03	0.03	0.01	0.03	0.04	<0.01	0.03
PHOSPHATE, DISSOLVED mg/l	00653	0.01	0.01	0.01	<0.01	0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
CONDUCTIVITY µ mhos	00095	300	290	285	295	285	285	285	285	280	285	275	280	280	280	280	285	275	275	285	290	295	295	285
RESIDUE, NONFILTRABLE mg/l	00530	1	5	9	1	4	6	1	4	9	3	23	18	15	5	4	19	1	1	4	7	5	15	1
OXYGEN DEMAND, CHEMICAL mg/l	00335	14.7	12.7	12.7	10.8	11.8	11.8	22.5	16.7	15.7	16.7	11.8	15.7	17.6	20.6	9.8	15.7	17.6	12.7	27.5	14.7	10.8	14.7	10.8
NITROGEN, AMMONIA mg/l	00610	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.39	0.27	0.24	0.30	0.35	0.34	0.28	0.31	0.33	0.33	0.29	0.33	0.31	0.25	0.25	0.25	0.28	0.31	0.27	0.30	0.39	0.34	0.37
NITROGEN ORGANIC mg/l	00605	0.10	0.20	0.10	0.10	0.07	0.28	0.10	0.16	0.10	0.00	0.07	0.28	0.10	0.04	0.04	0.12	0.10	0.04	0.12	0.12	0.20	0.12	0.12
IRON, TOTAL µg/l	01045	50	50	53	50	50	14	24	28	17	14	10	34	14	10	14	44	10	17	14	110	140	100	34
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	1	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1
PLATE COUNT 48hr., 35°C PER ml.	31753	7	14	12	11	14	8	13	11	10	5	5	13	11	7	19	23	13	9	0	28	40	34	17
MF-TC PER 100 ml.	31503	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MF-FS PER 100 ml.	31679	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLANKTON PER ml.	60050	580	-	400	-	360	-	880	280	180	160	300	860	120	600	540	280	180	260	160	600	-	1880	-
ACTINOS 14 DAY, 26°C PER ml.	80148	6	10	5	3	2	5	4	2	1	4	0	0	0	0	0	5	3	2	0	3	3	1	0
FUNGI PER ml.	31856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0

METEOROLOGICAL DATA									PREVAILING WINDS
TIME		0800	0900	1000	1100	1200	1300		00036
DIRECTION	00036	NW	NW	N	N	NE	NE		N
VELOCITY	00035	5	5	4	2	2	2		

SURVEY BY: J. Esposito & J. Shadle

REMARKS:

TABLE 30

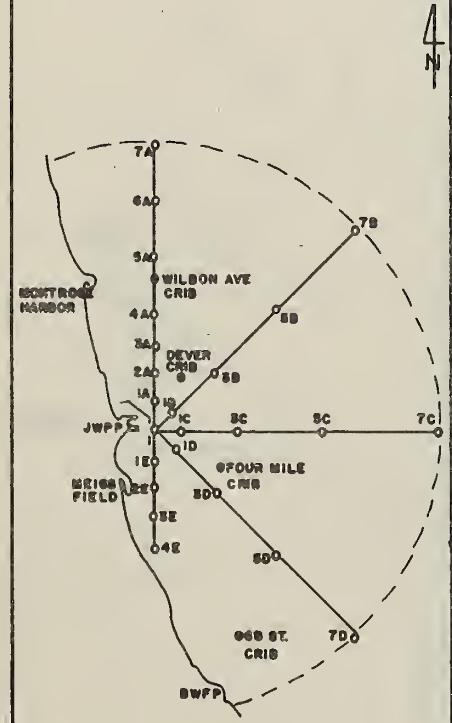
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

J.W.P.P. RADIAL LAKE SURVEY

DATE July 6, 19 78



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER																						
		1A	2A	3A	4A	5A	6A	7A	1B	3B	5B	7B	1C	3C	5C	7C	1D	3D	5D	7D	1E	2E	3E	4E
		CHW032	CHW047	CHW042	CHW037	CHW033	[illegible]	CHW025	[illegible]	[illegible]	[illegible]	CHW026	[illegible]	CHW044	[illegible]	CHW027	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	CHW051	[illegible]	CHW041
TIME		0934	0939	0943	0948	0957	1006	1015	1138	1129	1115	1055	1158	1207	1221	1239	1354	1346	1332	1314	1358	1403	1407	1412
TEMPERATURE °C	00010	15	17	17	17	18	18	18	19	20	20	20	19	19	20	20	19	19	19	19	18	18	17	17
TURBIDITY F.T.U.	00076	0.85	0.60	0.60	0.55	0.55	0.45	0.60	0.40	0.30	0.30	0.30	0.30	0.50	0.40	0.35	0.30	0.45	0.45	0.60	0.75	0.50	0.60	0.55
ODOR, THRESHOLD	00086	2Df	1Df	1Df	1M	2M	1M	1Df	1M	1M	1M	1M	1M	1M	1M	1DM	1M	1M	1M	1M	2Df	2Df	2Df	3Df
pH	00400	8.4	8.4	8.4	8.5	8.5	8.5	8.4	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
SULFATE mg/l	00945	20.0	20.0	19.2	18.0	18.0	18.0	18.5	19.5	19.0	19.5	20.0	19.5	20.0	21.5	20.0	19.5	20.0	20.8	20.0	20.5	21.5	21.8	21.0
CHLORIDE mg/l	00940	10.2	10.0	10.1	10.3	10.1	9.8	9.8	10.2	9.7	9.9	9.6	10.2	9.9	9.9	10.0	10.0	10.5	10.8	10.2	10.0	10.2	10.5	9.8
PHOSPHATE, TOTAL mg/l	00650	0.05	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PHOSPHATE, DISSOLVED mg/l	00653	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CONDUCTIVITY µ mhos	00095	280	295	295	300	295	295	295	295	295	295	295	300	295	295	295	280	295	300	300	300	300	300	295
RESIDUE, NONFILTRABLE mg/l	00530	1	2	8	5	7	8	1	8	6	1	4	3	4	1	1	4	2	2	5	3	8	3	5
OXYGEN DEMAND, CHEMICAL mg/l	00335	10.6	14.2	11.5	14.2	9.6	11.5	10.6	6.7	13.5	9.6	9.6	13.5	14.2	13.5	10.6	12.5	8.6	10.6	9.6	11.5	8.7	8.7	8.7
NITROGEN, AMMONIA mg/l	00610	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.24	0.24	0.24	0.26	0.25	0.25	0.24	0.26	0.26	0.25	0.24	0.25	0.26	0.25	0.25	0.24	0.26	0.26	0.26	0.23	0.25	0.25	0.24
NITROGEN ORGANIC mg/l	00605	0.12	0.20	0.10	0.12	0.08	0.36	0.09	0.16	0.10	0.10	0.08	0.28	0.12	0.12	0.20	0.28	0.12	0.04	0.12	0.20	0.12	0.20	0.12
IRON, TOTAL µg/l	01045	50	10	16	10	12	12	10	10	10	12	40	10	10	10	10	10	15	10	10	20	10	20	15
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48hr., 35°C PER ml.	31753	40	12	28	51	34	29	13	0	3	4	0	0	0	0	0	2	10	20	70	23	20	10	5
MF-TC PER 100 ml.	31503	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MF-FS PER 100 ml.	31679	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLANKTON PER ml.	60050	760	-	660	-	260	-	300	120	760	240	420	400	320	440	160	600	240	1680	580	720		1260	
ACTINOS 14 DAY, 26°C PER ml.	80148	0	1	0	0	0	0	1	0	1	0	0	3	2	1	0	1	0	0	0	0	0	0	0
FUNGI PER ml.	31856	0	0	2	0	0	0	0	0	0	1	0	2	1	0	0	0	0	0	0	1	1	0	0

METEOROLOGICAL DATA									PREVAILING WINDS
TIME		0900	1000	1100	1200	1300	1400		00036
DIRECTION	00036	S	S	S	S	S	SW		S
VELOCITY	00035	8	8	15	11	13	11		

SURVEY BY: J. Esposito & J. Shadle

REMARKS:

TABLE 31

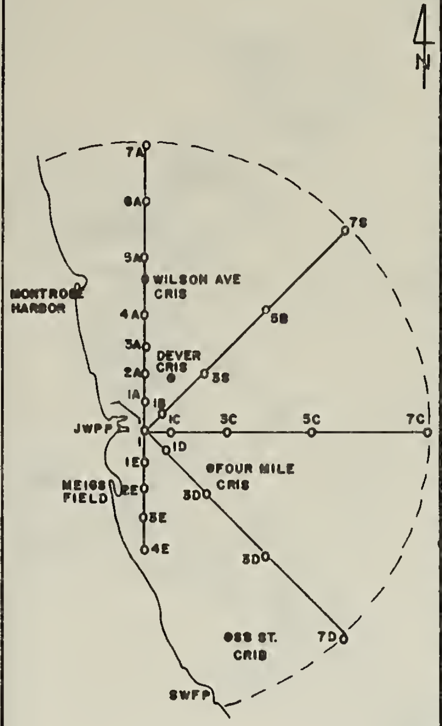
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

J.W.P.P. RADIAL LAKE SURVEY

DATE August 29, 19 78



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER																						
		1A	2A	3A	4A	5A	6A	7A	1B	3B	5B	7B	1C	3C	5C	7C	1D	3D	5D	7D	1E	2E	3E	4E
		CHW052	CHW047	CHW042	CHW037	CHW033	CHW029	CHW025	CHW053	CHW043	CHW034	CHW026	CHW054	CWW044	CHW035	CHW027	CHW055	CHW045	CHW036	CHW028	CHW056	CHW051	CHW046	CHW041
TIME		0855	0859	0904	0908	0947	0956	1005	1131	1112	1058	1040	1135	1144	1158	1216	1332	1323	1309	1251	1343	1347	1352	1356
TEMPERATURE °C	00010	15	16	17	16	16	16	16	18	19	20	21	17	17	22	22	17	18	19	22	17	18	17	17
TURBIDITY F.T.U.	00076	0.80	0.65	0.55	0.55	0.65	0.60	0.55	0.55	0.50	0.50	0.60	0.65	0.55	0.65	0.65	0.60	0.55	0.55	0.65	0.75	0.65	0.65	0.70
ODOR, THRESHOLD	00086	2M	1M	1M	1M	1M	1M	1M	1M	2M	1M	1M	2M	1M	1M	1M	1M	1M	1M	1M	20M	1M	1M	1M
pH	00400	8.3	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.5	8.5	8.6	8.5	8.5	8.6	8.6	8.5	8.5	8.5	8.6	8.5	8.5	8.5	8.5
SULFATE mg/l	00945	22.2	23.0	23.2	23.4	23.2	23.2	23.3	23.7	23.6	24.0	23.5	23.9	23.9	24.0	23.6	24.2	23.9	24.0	24.0	23.8	23.8	24.1	24.0
CHLORIDE mg/l	00940	10.2	10.2	9.8	9.8	9.6	10.0	9.8	10.0	10.0	10.2	10.2	10.0	10.2	10.1	10.0	10.4	10.8	9.4	9.4	9.6	9.6	9.8	10.0
PHOSPHATE, TOTAL mg/l	00650	0.02	0.05	0.02	0.02	<0.01	<0.01	<0.01	0.02	0.02	0.02	<0.01	<0.01	0.02	<0.01	0.02	0.04	0.02	<0.01	0.02	<0.01	0.03	0.03	<0.01
PHOSPHATE, DISSOLVED mg/l	00653	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CONDUCTIVITY µ mhos	00095	290	295	290	290	295	290	290	290	285	290	285	290	295	285	280	295	285	295	285	295	295	290	290
RESIDUE, NONFILTRABLE mg/l	00530	3	5	8	2	3	3	6	5	3	8	8	1	3	4	2	7	7	3	1	1	1	5	1
OXYGEN DEMAND, CHEMICAL mg/l	00335	9.8	9.8	8.9	8.9	8.9	3.0	8.9	6.9	9.8	7.9	7.9	6.9	6.9	6.9	9.8	6.9	6.9	4.9	6.9	7.9	7.9	7.9	8.9
NITROGEN, AMMONIA mg/l	00610	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
NITROGEN, NITRITE-NITRATE mg/l	00630	0.20	0.20	0.20	0.20	0.19	0.19	0.17	0.13	0.19	0.18	0.14	0.10	0.19	0.19	0.17	0.13	0.19	0.19	0.19	0.19	0.20	0.20	0.20
NITROGEN ORGANIC mg/l	00605	0.01	0.10	0.10	0.14	0.10	0.10	0.07	0.10	0.07	0.10	0.10	0.07	0.07	0.08	0.08	0.09	0.09	0.07	0.08	0.08	0.08	0.10	0.11
IRON, TOTAL µg/l	01045	28	10	10	10	10	10	10	16	14	10	10	10	10	10	22	12	10	10	16	14	10	10	10
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48hr., 35°C PER ml.	31753	14	0	5	3	12	3	0	9	2	17	14	0	0	62	1	5	1	3	92	6	6	1	2
MF-TC PER 100 ml.	31503	2	2	12	2	0	0	0	2	4	14	22	0	0	38	2	14	14	34	6	4	4	4	0
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	4	0	0	0
MF-FS PER 100 ml.	31679							ANALYSIS DISCONTINUED																
PLANKTON PER ml.	60050	940	-	820	-	920	-	80	120	40	160	0	660	320	60	20	280	460	0	20	1860	200	340	40
ACTINOS 14 DAY, 28°C PER ml.	80148	2	4	0	1	1	0	1	2	0	0	0	3	1	0	0	1	0	0	2	0	0	0	0
FUNGI PER ml.	31856	4	0	0	3	0	0	1	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0

METEOROLOGICAL DATA									PREVAILING WINDS
TIME		0800	0900	1000	1100	1200	1300		00036
DIRECTION	00036	W	NW	NW	N	N	NW		N
VELOCITY	00035	6	4	5	4	2	2		

SURVEY BY: J. Esposito & G. Slowik

REMARKS:

TABLE 32

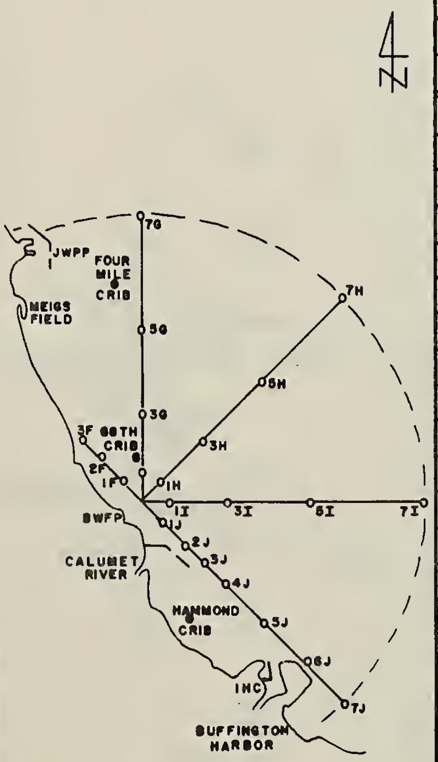
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

S.W.F.P. RADIAL LAKE SURVEY

DATE April 27, 19 78



PARAMETER	STORET NUMBER	1F	2F	3F	1G	3G	5G	7G	1H	3H	5H	7H	1I	3I	5I	7I	1J	2J	3J	4J	5J	6J	7J
		CHW083	CHW076	CHW073	CHW084	CHW074	CHW085	CHW057	CHW085	CHW075	CHW086	CHW058	CHW086	CHW079	CHW067	CHW059	CHW087	CHW082	CHW077	CHW072	CHW088	CHW064	CHW060
TIME		1202	1207	1212	0946	0937	0923	0905	1229	1238	1252	1310	1143	1134	1120	1102	0955	1000	1004	1009	1018	1027	1036
TEMPERATURE °C	00010	9	9	9	7	7	6	5	8	7	6	5	8	8	7	6	8	8	8	8	8	12	9
TURBIDITY F.T.U.	00076	3.8	3.8	3.4	2.1	0.80	0.65	0.55	2.6	0.95	0.35	0.35	1.7	1.6	1.4	0.70	3.5	3.5	2.8	2.8	3.0	3.2	2.7
ODOR, THRESHOLD	00086	1M	1M	1M	2f	1f	2f	1f	2f	1f	2f	2f	1M	2M	1M	1M	2M	1M	1M	1M	1M	3Cn	1M
pH	00400	8.4	8.3	8.3	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.2	8.4
SULFATE mg/l	00945	23.4	24.0	24.5	24.5	23.0	23.0	22.0	24.0	24.0	23.5	23.8	26.0	24.3	24.5	24.2	26.3	27.0	27.5	27.5	26.5	47.0	28.5
CHLORIDE mg/l	00940	11.8	12.0	11.8	11.8	10.8	10.5	10.8	11.8	11.6	11.0	10.5	12.0	11.5	11.0	11.0	12.2	12.0	12.0	12.0	10.8	20.0*	12.0
PHOSPHATE, TOTAL mg/l	00650	0.02	0.06	0.05	0.03	0.03	0.07	0.09	0.10	0.02	0.03	0.02	0.09	0.02	0.02	0.03	0.09	0.12	0.06	0.02	0.02	0.02	<0.01
PHOSPHATE, DISSOLVED mg/l	00653	<0.01	<0.01	0.01	0.01	<0.01	0.01	<0.01	0.03	<0.01	<0.01	<0.01	0.02	<0.01	0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
CONDUCTIVITY µ mhos	00095	300	300	295	295	280	275	275	290	280	280	275	305	285	280	270	295	295	305	300	285	360	300
RESIDUE, NONFILTRABLE mg/l	00530	19	1	1	2	7	1	6	4	10	6	9	9	9	5	5	15	3	4	15	16	21	11
OXYGEN DEMAND, CHEMICAL mg/l	00335	28.6	14.3	11.2	8.2	8.2	10.2	7.1	8.2	7.1	10.2	7.1	11.2	9.2	7.1	7.1	8.2	23.5	18.4	16.3	12.2	15.3	22.4
NITROGEN, AMMONIA mg/l	00610	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.05
NITROGEN, NITRITE-NITRATE mg/l	00630	0.38	0.38	0.37	0.34	0.30	0.29	0.30	0.33	0.33	0.29	0.29	0.39	0.31	0.28	0.27	0.37	0.37	0.41	0.40	0.32	0.64	0.37
NITROGEN, ORGANIC mg/l	00605	0.16	0.12	0.07	0.12	0.10	0.12	0.12	0.12	0.10	0.16	0.12	0.12	0.07	0.12	0.07	0.12	0.12	0.12	0.12	0.12	0.16	0.12
IRON, TOTAL µg/l	01045	130	100	100	65	20	20	20	60	35	20	20	60	20	27	20	60	80	55	45	40	80	40
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48hr., 35°C PER ml.		2	5	2	1	4	0	1	8	0	0	1	10	3	1	0	1	12	5	0	0	17000	11000
MF-TC PER 100 ml.	31503	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	162	48
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0
MF-FS PER 100 ml.	31679	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLANKTON PER ml.	60050	1060		440	860	80	1260	200	180	940	640	20	1200	800	620	20	140		800		640		660
ACTINOS 14 DAY, 20°C PER ml.		11	9	10	9	0	0	1	1	2	0	0	0	3	0	0	4	7	11	8	1	2	1
FUNGI PER ml.		1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0

METEOROLOGICAL DATA									PREVAILING WINDS
TIME		0900	1000	1100	1200	1300			00036
DIRECTION	00036	NW	NW	N	N	N			N
VELOCITY	00035	4	3	2	2	1			

SURVEY BY: GS & JE

REMARKS:

* Checked

TABLE 33

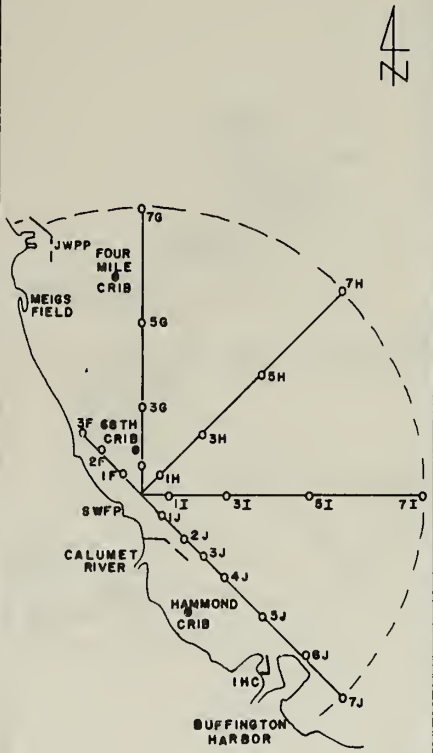
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

S.W.F.P. RADIAL LAKE SURVEY

DATE May 31, 19 78



PARAMETER	STORET NUMBER	1F	2F	3F	1G	3G	5G	7G	1H	3H	5H	7H	1I	3I	5I	7I	1J	2J	3J	4J	5J	6J	7J
		CHW083	CHW078	CHW073	CHW084	CHW074	CHW085	CHW057	CHW08[illegible]	CHW075	CHW086	CHW058	CHW066	CHW076	CHW067	CHW059	CHW087	CHW082	CHW077	CHW072	CHW068	CHW064	CHW060
TIME		1155	1159	1204	0951	0942	0928	0910	1218	1227	1241	1259	1000	1009	1023	1041	1147	1143	1138	1133	1124	1115	1106
TEMPERATURE °C	00010	12	12	12	12	13	14	14	13	15	16	16	13	15	15	15	13	13	13	15	14	16	16
TURBIDITY F.T.U.	00076	0.60	0.55	0.60	0.55	0.55	0.55	0.60	0.50	0.55	0.50	0.50	0.60	0.50	0.50	0.45	0.55	0.60	0.55	0.50	0.55	0.65	0.70
ODOR, THRESHOLD	00086	1M	1M	1F	1F	1F	1F	2F	1M	1M	1M	1M	1F	1M	1M	1M	1M	1M	1M	1M	1M	2Cn	1M
pH	00400	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
SULFATE mg/l	00945	20.0	18.5	20.0	19.5	20.0	20.3	20.3	20.5	20.5	21.0	20.0	20.0	21.0	21.5	20.0	20.0	21.0	21.0	21.0	21.0	24.5	24.3
CHLORIDE mg/l	00940	10.1	10.0	9.8	9.9	10.0	10.1	9.8	10.1	10.1	10.1	10.0	10.1	10.1	10.1	9.8	10.0	10.1	10.0	10.0	10.1	10.4	10.3
PHOSPHATE, TOTAL mg/l	00650	0.02	0.03	0.01	0.01	0.02	0.01	0.02	0.01	0.03	0.06	0.02	0.03	0.01	0.03	0.01	0.01	<0.01	0.03	0.01	0.01	0.01	0.02
PHOSPHATE, DISSOLVED mg/l	00653	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
CONDUCTIVITY µ mhos	00095	300	290	290	290	300	300	290	300	310	310	300	290	300	305	295	295	300	300	300	300	310	310
RESIDUE, NONFILTRABLE mg/l	00530	12	7	12	3	2	1	3	2	8	3	5	5	5	5	4	4	16	7	28	6	18	16
OXYGEN DEMAND, CHEMICAL mg/l	00335	6.9	5.9	17.6	8.8	8.7	10.6	13.5	10.6	9.6	10.6	23.1	14.4	10.8	10.8	9.8	5.9	11.8	5.9	5.9	6.9	8.8	7.8
NITROGEN, AMMONIA mg/l	00610	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.07	0.05
NITROGEN, NITRITE-NITRATE mg/l	00630	0.23	0.20	0.22	0.23	0.25	0.25	0.21	0.24	0.25	0.26	0.24	0.24	0.25	0.26	0.24	0.23	0.24	0.24	0.24	0.24	0.28	0.28
NITROGEN, ORGANIC mg/l	00605	0.12	0.24	0.16	0.20	0.12	0.16	0.12	0.12	0.08	0.08	0.12	0.12	0.08	0.08	0.12	0.12	0.08	0.08	0.08	0.12	0.16	0.12
IRON, TOTAL µg/l	01045	15	<10	10	12	15	<10	<10	<10	10	22	15	15	10	12	<10	<10	17	12	15	15	40	40
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48hr., 35°C PER ml.	31753	65	0	18	40	36	60	18	48	40	60	10	120	96	53	4	150	140	105	55	150	2800	3200
MF-TC PER 100 ml.	31503	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	4	72	100
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MF-FS PER 100 ml.	31679	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLANKTON PER ml.	60050	160	-	100	360	60	60	700	420	0	360	20	60	40	20	0	100	-	760	-	320	-	260
ACTINOS 14 DAY, 26°C PER ml.	80148	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1
FUNGI PER ml.	31856	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0

METEOROLOGICAL DATA								PREVAILING WINDS
TIME		0800	0900	1000	1100	1200	1300	1400	00036
DIRECTION	00036	E	NE	NE	E	E	E	SE	E
VELOCITY	00035	1	1	1	3	4	4	2	

SURVEY BY: J. Esposito & E. Evangelista

REMARKS:

TABLE 34

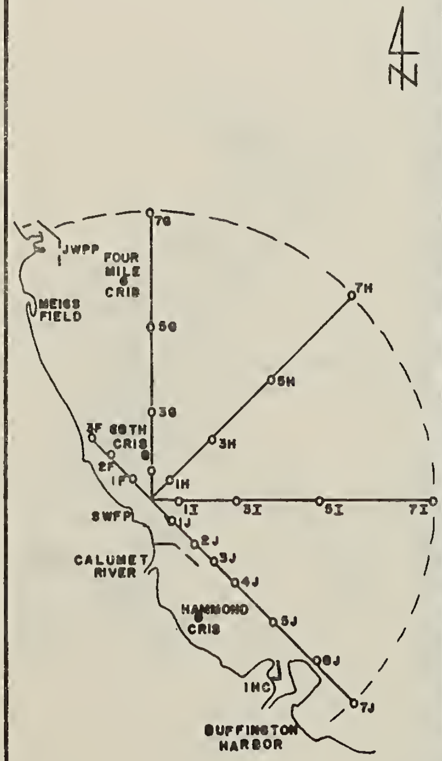
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

S.W.F.P. RADIAL LAKE SURVEY

DATE July 18, 19 78



PARAMETER	STORET NUMBER	SAMPLING POINT AND STATION NUMBER																					
		1F	2F	3F	1G	3G	5G	7G	1H	3H	5H	7H	1I	3I	5I	7I	1J	2J	3J	4J	5J	6J	7J
		CHW033	CHW078	CHW073	CHW084	CHW074	CHW065	CHW057	CHW068	CHW075	CHW066	CHW069	CHW056	CHW076	CHW058	CHW059	CHW067	CHW062	CHW077	CHW072	CHW063	CHW064	CHW060
TIME		1155	1200	1204	0946	0937	0923	0905	1220	1229	1243	1301	0957	1006	1020	1038	1144	1140	1135	1131	1122	1113	1104
TEMPERATURE °C	00010	14	14	14	17	18	18	18	17	16	17	19	16	18	18	18	15	16	18	18	18	18	18
TURBIDITY F.T.U.	00076	0.90	0.85	1.20	0.55	0.50	0.55	0.50	0.60	0.55	0.60	0.40	0.60	0.50	0.65	0.45	0.90	0.80	0.65	0.75	0.80	0.70	0.55
ODOR, THRESHOLD	00086	2Df	2Df	2Df	1M	1M	2M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M
pH	00400	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
SULFATE mg/l	00945	20.8	21.0	21.5	22.0	22.3	22.2	21.2	22.0	22.0	22.0	21.5	22.5	22.5	23.0	22.8	21.5	22.0	22.0	23.0	23.7	21.3	23.0
CHLORIDE mg/l	00940	9.8	10.0	9.4	10.2	10.1	9.8	9.4	9.4	9.4	10.0	9.7	9.8	9.6	10.0	9.5	9.0	10.1	9.6	9.4	10.4	9.6	9.4
PHOSPHATE, TOTAL mg/l	00650	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.03	0.03	0.02	0.02	0.01	0.01	0.03	0.02	0.02	0.01	0.02	0.02
PHOSPHATE, DISSOLVED mg/l	00653	0.01	0.01	0.01	<0.01	<0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.01	<0.01	0.01	0.01	0.01	0.01	<0.01	0.01	0.02	0.01
CONDUCTIVITY µ mhos	00095	285	295	295	295	300	300	290	300	295	300	300	295	290	295	300	295	285	300	300	310	300	305
RESIDUE, NONFILTRABLE mg/l	00530	2	1	2	3	1	1	1	5	4	1	1	3	1	4	1	1	2	2	1	1	2	6
OXYGEN DEMAND, CHEMICAL mg/l	00335	13.8	12.8	10.6	5.3	8.5	8.5	7.4	10.6	9.6	9.6	7.4	11.7	7.4	7.4	7.4	8.5	10.6	8.5	8.5	12.8	9.6	11.7
NITROGEN, AMMONIA mg/l	00610	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01
NITROGEN, NITRITE-NITRATE mg/l	00630	0.23	0.22	0.21	0.24	0.24	0.24	0.25	0.24	0.24	0.24	0.24	0.24	0.24	0.25	0.24	0.22	0.23	0.24	0.24	0.25	0.24	0.24
NITROGEN, ORGANIC mg/l	00605	0.16	0.16	0.20	0.13	0.13	0.13	0.04	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.16	0.13	0.20	0.16	0.16	0.20	0.16	0.16
IRON, TOTAL µg/l	01045	30	22	25	15	16	16	10	10	10	10	12	10	10	22	10	15	10	12	18	10	10	10
PHENOL-LIKE SUBSTANCES µg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48hr., 35°C PER ml.	31753	54	70	40	36	62	39	32	44	40	52	12	110	85	1200	30	140	160	320	460	2400	1500	65
MF-TC PER 100 ml.	31503	4	2	4	6	0	0	0	4	4	0	0	6	2	42	0	8	8	0	16	72	4	0
MF-FC PER 100 ml.	31616	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0
MF-FS PER 100 ml.	31679	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLANKTON PER ml.	60050	1680	4860	2080	180	100	720	60	360	120	1240	20	1080	600	780	420	1140	-	1440	-	880	320	1820
ACTINOS 14 DAY, 20°C PER ml.	80148	1	0	0	0	0	0	0	1	0	0	3	3	0	0	0	1	3	1	0	0	0	1
FUNGI PER ml.	31856	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	1	0	0	1

METEOROLOGICAL DATA									PREVAILING WINDS
TIME		0800	0900	1000	1100	1200	1300	1400	00036
DIRECTION	00036	SW	SW	S	SW	S	S	S	S
VELOCITY	00035	11	11	9	9	10	10	12	

SURVEY BY: J. Esposito & G. Slowik

REMARKS:

TABLE 35

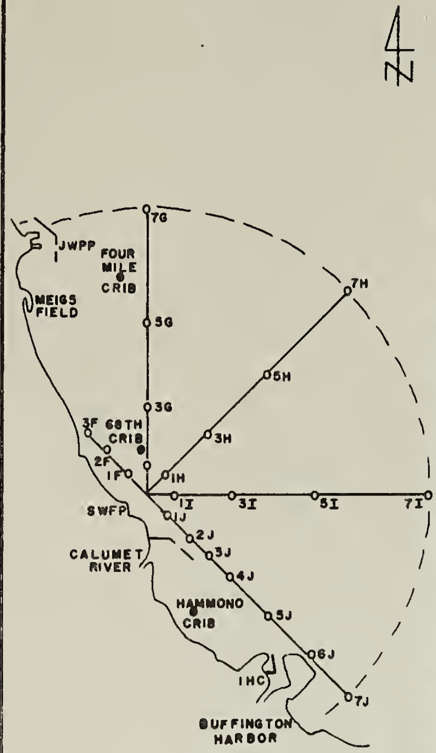
CITY OF CHICAGO
WATER PURIFICATION DIVISION

DEPARTMENT OF WATER AND SEWERS
WATER QUALITY SURVEILLANCE SECTION

BUREAU OF WATER OPERATIONS
WATER PURIFICATION LABORATORY

S.W.F.P. RADIAL LAKE SURVEY

DATE Oct. 3, 19 78



PARAMETER	STORET NUMBER	1F	2F	3F	1G	3G	5G	7G	1H	3H	5H	7H	1I	3I	5I	7I	1J	2J	3J	4J	5J	6J	7J
		CHW083	CHW078	CHW073	CHW084	CHW074	CHW068	CHW057	CHW065	CHW075	CHW086	CHW058	CHW066	CHW076	CHW067	CHW059	CHW087	CHW082	CHW077	CHW072	CHW085	CHW064	CHW060
TIME		1239	1245	1248	1027	1018	1002	0944	1303	1312	1326	1347	1032	1041	1058	1116	1231	1226	1221	1217	1204	1155	1148
TEMPERATURE °C	00010	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
TURBIDITY F.T.U.	00076	1.3	1.0	1.0	1.2	1.0	0.85	0.75	0.95	0.80	0.85	0.55	0.70	0.65	0.85	0.55	0.95	0.80	0.85	0.85	1.2	1.2	0.90
ODOR, THRESHOLD	00086	2Df	2Df	3Df	1M	1M	3DM	2M	1M	1M	1M	2M	1M	1M	1M	1M	2M	2Df	1Df	1M	2M	1M	1M
pH	00400	8.4	8.4	8.4	8.4	8.4	8.5	8.5	8.5	8.5	8.5	8.4	8.5	8.5	8.4	8.5	8.4	8.5	8.5	8.5	8.4	8.4	8.4
SULFATE mg/l	00945	18.0	19.0	19.5	20.5	19.0	18.5	18.5	20.5	19.5	19.5	19.5	20.0	20.0	20.5	20.3	22.5	21.5	21.5	22.0	24.5	24.5	22.5
CHLORIDE mg/l	00940	9.4	9.6	9.6	9.8	9.0	9.2	9.0	9.6	9.6	9.6	9.8	9.6	9.6	9.4	9.2	10.0	10.0	10.0	10.2	10.2	10.2	9.6
PHOSPHATE, TOTAL mg/l	00650	0.05	0.05	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.03	0.03	0.02	0.02	0.03	0.04	0.03
PHOSPHATE, DISSOLVED mg/l	00653	0.01	0.02	0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	0.01	<0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.03	0.01
CONDUCTIVITY μ mhos	00095	280	295	295	290	285	285	285	290	285	280	285	285	285	290	285	290	290	295	300	285	295	290
RESIDUE, NONFILTRABLE mg/l	00530	23	20	22	15	14	16	8	8	10	13	9	11	14	17	9	5	8	23	10	8	5	16
OXYGEN DEMAND, CHEMICAL mg/l	00335	9.8	7.8	9.8	8.8	7.8	6.9	6.9	8.8	10.8	6.9	6.9	6.9	5.9	7.8	12.7	7.8	8.8	8.8	9.8	10.8	8.8	10.8
NITROGEN, AMMONIA mg/l	00610	0.02	0.01	0.01	0.03	0.01	0.01	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.04
NITROGEN, NITRITE-NITRATE mg/l	00630	0.20	0.19	0.19	0.17	0.15	0.15	0.14	0.15	0.13	0.13	0.12	0.13	0.14	0.17	0.13	0.16	0.15	0.16	0.16	0.19	0.18	0.17
NITROGEN, ORGANIC mg/l	00605	0.12	0.10	0.10	0.08	0.10	0.10	0.10	0.11	0.10	0.10	0.12	0.12	0.12	0.08	0.08	0.12	0.08	0.08	0.08	0.08	0.08	0.10
IRON, TOTAL μg/l	01045	22	22	20	10	<10	<10	20	21	<10	21	<10	12	10	56	<10	15	20	20	22	65	18	18
PHENOL-LIKE SUBSTANCES μg/l	32730	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PLATE COUNT 48hr., 35°C PER ml.	31753	1200	770	780	4200	640	450	220	1400	260	350	210	360	320	370	180	3600	1500	1600	960	1300	1800	1800
MF-TC PER 100 ml.	31503	280	164	264	244	120	168	88	340	92	60	52	120	200	192	160	288	168	164	128	216	304	200
MF-FC PER 100 ml.	31616	18	8	4	24	0	0	0	34	0	2	0	0	0	0	0	44	32	20	2	12	14	2
MF-FS PER100 ml.	31679	-			-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	2	0
PLANKTON PER ml.	60050	600		620	700	760	300	180	340	320	240	140	700	200	780	280	1060	-	1680	-	1040	-	700
ACTINOS 14 DAY, 26°C PER ml.	80148	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
FUNGI PER ml.	31856	0	1	0	0	1	0	0	0	0	0	0	2	2	1	0	1	0	0	0	0	3	1

METEOROLOGICAL DATA								PREVAILING WINDS
TIME		0800	0900	1000	1100	1200	1300	00036
DIRECTION	00036	W	W	W	W	SW	SW	W
VELOCITY	00035	6	8	7	7	9	5	

SURVEY BY: M.K. & G.S.

REMARKS:

Appendix B

GLOSSARY OF TERMS

Appendix B

GLOSSARY OF TERMS

Actinomycetes. A group of organisms related to both fungi and bacteria with the capacity to produce quantities of odoriferous substances. Identification of their relative abundance in a drinking water source provides a parameter in the assessment of water quality. Organic substances such as phenol, cellulose and dead plant cells will provide sufficient carbon and nitrogen to stimulate actinomycetes population growth.

Chloride. Chlorides are one of the most common naturally occurring chemical constituents of surface waters. Sanitary wastes and certain industrial discharges may contribute significant amounts of chloride to receiving waters. At increasing concentrations chloride will cause a slight decrease in the solubility of oxygen in water and can harm metallic equipment along with agricultural plants.

Coliform, Total. Bacteria characterized by gram-negative asprogenous rods. Total coliform bacteria are associated with feces of warmblooded animals as well as in soils and on plants.

Coliform, Fecal. Bacteria that comprise a portion of the total coliform group. Fecal coliform are of more sanitary significance than total coliform because they are restricted to the intestinal tract of warmblooded animals. Consequently, this group serves as a reliable indicator of recent sewage contamination.

Conductivity. The measure of the ability of a substance to conduct an electric current. The measurement provides an indication of ion concentration or dissolved solids.

Fungi. Achlorophyllous organisms that are able to grow in the absence of light. Favorable growth followed by a large number die-off results in disagreeable tastes and odors.

Iron. Iron is an abundant element common in many rocks and soils and may be present in water in varying quantities, dependent upon the geology of the area and other chemical components of the waterway. Iron pollution sources include industrial wastes, mine drainage waters, and iron-bearing groundwaters.

Nitrogen, Ammonia. Ammonia nitrogen is one of the compounds resulting from the metabolic activity of living organisms. It may be present in surface waters as a result of agricultural runoff, certain industrial wastes, and runoff from pastures or feedlots. It is a component of sewage and relatively high concentrations may be found in the effluents of sewage treatment facilities. Ammonia is toxic to fishes and toxicity varies with water temperature and pH.

Nitrogen, Nitrite - Nitrate. Nitrates are the metabolic end products of organic nitrogen decomposition. They are commonly found in surface waters as a result of the decomposition of organic nitrogen in polluted streams and from sewage effluents, agricultural runoff, cesspool leaching, and industrial discharges. Nitrites in natural waters result from bacterial action upon ammonia and organic nitrogen. Because they are readily oxidized to nitrates, nitrites are not normally found in significant concentrations in surface waters. If present in sufficient concentrations in public water supplies, nitrate-nitrite may cause infant methemoglobinemia, a disease causing blood changes and cyanosis.

Nitrogen, Organic. Organic nitrogen is defined functionally as organically bound nitrogen. Organic nitrogen includes such natural materials as proteins and peptides, nucleic acids and urea, and numerous synthetic organic materials.

Odor, threshold. Odor is recognized as a quality factor affecting water in several ways: Acceptability of drinking water, tainting of fish and other aquatic organisms, and aesthetics of recreational waters. Odor tests are performed to arrive at qualitative descriptions and approximate quantitative measurements of odor intensity. The method for intensity measurement is the threshold odor test.

Oxygen Demand, Chemical. A measure of the oxygen-consuming capacity of inorganic and organic matter present in water or wastewater.

pH. pH is the logarithm of the reciprocal of the hydrogen ion concentration. In practice, it is the measurement of the concentration of hydrogen ions. By definition, the pH range is from 0 (most acidic) to 14 (most alkaline). Since the concentration of hydrogen ions regulates the degree of dissociation of many substances, pH may be a significant factor in determining limiting threshold concentrations in natural waters.

Phenols. Phenols are associated with industrial wastes from coal distillation processes and the manufacture of plastics, dyes, and disinfectants. Relatively small concentrations can cause taste and odor problems in public water supplies.

Phosphate, Total. Phosphate phosphorus is found in domestic sewage, some industrial wastes, and in drainage from agricultural areas. It is one of the nutrients responsible for excessive algae growth.

Phosphate, dissolved (total filtrable). The phosphate forms that pass through a 0.45 um membrane.

Plankton. Organisms (small animal-zooplankton and plant-phytoplankton) suspended in a body of water and because of their physical character or size are incapable of sustained mobility in directions counter to water currents.

Plate count. Number of colonies of bacteria grown on selected solid media at a given temperature and incubation period. The procedure provides a standardized means of determining the density of bacteria in water.

Potassium. Naturally occurring element that is an essential plant nutrient. High concentrations in water may be as a result of a discharge, ground water or sedimentary runoff.

Residue, filterable. The dissolved mineral constituents of water that will pass through a 0.45 um filter and remain after evaporation. Also called total dissolved solids.

Residue, nonfilterable. The portion of the total residue retained by a 0.45 um filter.

Silica, SiO_2. Silica is essential to diatoms which incorporate it into their exoskeleton. If other nutrients and light are available, diatom populations will increase causing a reduction in silica concentrations.

Sodium. Naturally occurring element in surface waters. Relatively high concentrations may be found in brines and hard waters.

Streptococcal, Fecal. The fecal streptococcal group of bacteria is closely associated with fecal and sewage discharges. This group serves as a supplementary indicator of recent sewage contamination.

Sulfate. Sulfate is a component of natural bodies of water. Abnormal fluctuations in background levels may be the result of industrial waste discharges. In drinking water supplies, high sulfate concentrations may have a cathartic effect.

Turbidity. Turbidity is a measure of the extent to which light penetration in water is diminished by the presence of suspended and colloidal matter.

The definitions in this appendix were derived in part from the references listed below:

1. Illinois Pollution Control Board. 1977. Rules and Regulations, Chapter 3, Water Pollution, 54 pp.

2. McKee, Jack Edward and Harold W. Wolf, eds. 1971. Water Quality Criteria, California State Water Resources Control Board, Publication 3-A, 548 pp.

3. Rand, M.C. 1975. Standard Methods for the Examination of Water and Wastewater, Fourteenth Edition, American Public Health Association, 1193 pp.

4. U.S. Department of the Interior. 1966. Sanitary Significance of Fecal Coliforms in the Environment, Federal Water Pollution Control Administration, WP-20-3, 122 pp.

5. U.S. Department of Transportation 1976. Water Quality Manual, Vol. 4 of Implementation Package 77-1.

6. U.S. Environmental Protection Agency. 1976. Quality Criteria for Water, 256 pp.

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